DO YOUR PHD, HONOURS OR MASTERS AT WESTMEAD

REAL PEOPLE. REAL SCIENCE.
Welcome to the Westmead Research Hub Student Open Day

The Westmead campus currently has over 300 higher degree students, as well as Honours and Medical students. We hope you consider joining them in 2018.

Join the conversation #WRHOpenDay
Contents

Schedule .................................................................................................................................................. 02
About the Westmead Research Hub ..................................................................................................... 03
Scholarships ......................................................................................................................................... 04
Undergraduate Research Opportunities on the Westmead Research Hub ........................................... 05
Postgraduate Research Degrees ........................................................................................................... 06
StResS (Student Research Society) ....................................................................................................... 07
Research opportunities at the University of Sydney Westmead .............................................................. 07
About Children’s Medical Research Institute (CMRI) .......................................................................... 08
About Kids Research Institute (KRI) .................................................................................................... 09
About The Westmead Institute for Medical Research (WIMR) ............................................................... 10

Projects

Cancer .................................................................................................................................................... 11-15
Cardiovascular disease ........................................................................................................................ 16-17
Genetic disease ..................................................................................................................................... 18-20
Immunity ................................................................................................................................................ 21-22
Infectious disease ................................................................................................................................. 23-26
Kidney disease ..................................................................................................................................... 27
Metabolic ................................................................................................................................................ 28
Neurobiology ......................................................................................................................................... 29-30
Specialty ................................................................................................................................................ 31-33

Schedule - 9 August, 2017

1 pm: Doors Open
1.15 – 1.30 pm: Welcoming Address
1.30 – 2.30 pm: Stalls, posters and afternoon tea
2.30 – 4 pm: Tours of all institutions
4 pm: BBQ plus free drinks

Sponsors

Arab Bank Australia
About the Westmead Research Hub

The Westmead Research Hub is the largest health and medical research precinct in the southern hemisphere. We are a collaboration between world-leading organisations with expertise in medical research, health and education.

Our members:

- Children’s Medical Research Institute cmri.org.au
- Kids Research Institute at The Children's Hospital at Westmead www.kidsresearch.org.au
- Westmead Clinical School sydney.edu.au/medicine/westmead/
- The Children’s Hospital at Westmead Clinical School sydney.edu.au/medicine/chw/
- Westmead Hospital wslhd.health.nsw.gov.au/Westmead-Hospital/westmead-hospital
- Institute of Clinical Pathology and Medical Research pathology.health.nsw.gov.au/our-networks/pathology-west
- The Westmead Institute for Medical Research westmeadinstitute.org.au
- The University of Sydney sydney.edu.au
Scholarships

Research Training Program (RTP) & others

A range of scholarships are available for research students undertaking a Masters (by research) and PhD. The Research Training Program Stipend Scholarship (RTP), formerly known as the Australian Postgraduate Award (APA), and the University of Sydney Postgraduate Awards (UPA) are competitive scholarships offered to postgraduate research students and provide a stipend/living allowance. Other options are available through private bodies, such as the Heart Foundation, Cancer Council and so on. Additionally, a limited number of Faculty Scholarships and other research specific scholarships may also be available.

For more information on the RTP and other University of Sydney/Faculty scholarships, please visit: www.sydney.edu.au/scholarships.

National Health and Medical Research Council (NHMRC) Postgraduate Scholarships

Outstanding health and medical graduates early in their career can also apply for a small number of highly competitive NHMRC Scholarships. Considerable care should be exercised in the preparation of your application. The University of Sydney prepares a yearly helpful guide to help you with your application, which can be found at: http://sydney.edu.au/scholarships/research/faculty/medicine.shtml#nhmrc. For further information on the NHMRC Scholarships and to lodge an application, visit: https://www.nhmrc.gov.au/grants-funding/apply-funding/postgraduate-scholarships.

Further advice

Further advice for University of Sydney applicants can be obtained via:

Phone:
1800 SYD UNI (1800 793 864)
+61 2 8627 1444 (outside Australia)
Available between 9am and 5pm Australian Eastern Standard Time, Monday to Friday.

Online
If you are a future student and have a scholarship enquiry please fill out a course enquiry form: http://sydney.edu.au/courses/ask_a_question

Academic Questions
Paul Witting
Associate Professor Paul Witting, the Associate Dean for Higher Degree Research Recruitment and Training paul.witting@sydney.edu.au
Undergraduate Research Opportunities on the Westmead Research Hub

Honours program
The University of Sydney launched a dedicated Honours in Medical Sciences program at the Westmead campus. This honours program offers an exceptional opportunity to study under the close supervision of leading research experts in a translational setting at the largest health and medical precinct in Australia. A significant advantage of conducting your honours project at Westmead is the one-on-one supervision you will receive from outstanding researchers who are 100% committed to medical research. Many of these researchers have strong collaborations with clinicians in the adjacent hospitals, which offers the opportunity for truly translational research with a 'bench to bedside' ethos. The Westmead campus also offers students access to state of the art cutting-edge technologies.

- Projects are available at all of the Westmead campus institutes and hospitals; see lists of supervisors and project examples at the end of this book;
- All research, classwork and seminars for the Honours program will be carried out at Westmead;
- First step is to find a project and supervisor of interest; supervisors will be present in the stall area from 1.30 – 2.30 pm.

For more information:
http://sydney.edu.au/medicine/study/honours/westmead/
or come along to The Westmead Honours Information Evening
Monday 11th September, 5 - 9.30pm,
The Westmead Institute for Medical Research

Contact for Honours Information
Dr Andrew Harman
andrew.harman@sydney.edu.au

Summer Research Scholarships
The University of Sydney Summer Research Scholarships offer a unique opportunity for students to obtain experience in medical-related research and provide a fantastic insight into the research process. The scholarships offer students the experience of conducting full-time research with well-established researchers in high quality medical research facilities.

What do they offer?
- the opportunity to undertake a research project over a period of eight weeks over summer
- supervision by well-established researchers
- excellent research facilities
- $300 per week stipend

Who can apply?
The scholarships are open to students currently enrolled full-time at any Australian university in an undergraduate degree or professional doctorate.

For a list of projects available at Westmead, please refer to listings at the below Westmead institutions:
- Children’s Hospital at Westmead
- Children’s Medical Research Institute
- Faculty of Dentistry
- Westmead Clinical School
- The Westmead Institute for Medical Research
- Institute of Clinical Pathology and Medical Research
Postgraduate Research Degrees

The majority of students in the Hub are enrolled through the University of Sydney, although some programs allow enrolment through other universities.

Join our globally renowned community of scholars

Whether you’re an aspiring academic, seeking a competitive edge in your career or want to explore your passion, a PhD or Master’s by research is the ideal choice.

Consistently ranked among the best research universities in the world, the University of Sydney and Westmead are home to many leading researchers and attract generous funding in support of our research projects.

Embarking on a PhD or masters by research is an opportunity to join a community of recognised leaders in scholarship and make a significant contribution to your area of study.

As a researcher, you will work alongside some of the world’s brightest and most accomplished academics. You will have access to high-calibre facilities and all the support you need, from day one through to the end of your studies.

Our postgraduate research degrees include:

Masters degree by research and Master of Philosophy
Doctor of Philosophy (PhD)

http://sydney.edu.au/study/find-a-course/postgraduate-study/postgraduate-research.html

Contact the relevant Postgraduate Coordinators below to learn more:

**Children’s Medical Research Institute**
A/Prof. Tracy Bryan
Sub-Dean (Postgraduate Research),
Head of Cell Biology Unit

A/Prof. Nicholas Wood
Sub-Dean (Postgraduate Research),
The Children’s Hospital at Westmead Clinical school

A/Prof. Ky-Anh Nguyen
Postgraduate Coordinator,
Discipline of Life Sciences

**The Westmead Institute for Medical Research and Westmead Hospital**
Dr Cameron Webb
Sub-Dean (HDR)
Sydney Medical School - Westmead

**Kids Research Institute and The Children’s Hospital at Westmead**
A/Prof. Nicholas Wood
Sub-Dean (Postgraduate Research),
The Children’s Hospital at Westmead Clinical school

**The Faculty of Dentistry and Institute of Dental Research**
A/Prof Ky-Anh Nguyen
Postgraduate Coordinator,
Discipline of Life Sciences

Information on how to apply for a PhD/MPhil at the University of Sydney:
http://sydney.edu.au/study/admissions/apply/how-to-apply.html
St.Res.S  
(Student Research Society)

StResS@Westmead is a social society for research students who are based at or affiliated with the Westmead campus. StResS engages with and connects the diverse array of research students at Westmead through a variety of social and educational events and aims to create an exciting and supportive student atmosphere on and around campus.

facebook.com/STRESSWESTMEAD  
twitter.com/Stress_Westmead

Research opportunities at the University of Sydney Westmead

The University of Sydney offers a diverse range of postgraduate research degrees which produce groundbreaking work across a wide range of disciplines. At Sydney we have a particular focus on cross-disciplinary study, encouraging new ways of thinking about problems in areas critical to our common future.

Research candidates based at the University of Sydney Westmead undertake diverse research spanning from the laboratory to the patient, where they help solve real-world problems in both research and treatment.

As a researcher at Sydney, you will work alongside some of the world’s brightest and most accomplished academics. You will have access to high-calibre facilities and all the support you need, from day one through to the end of your studies. From communication and project management skills to career development opportunities, we will give you what you need to thrive while enjoying the freedom offered by a research degree.

Undertake research opportunities with: Sydney Medical School, Sydney Nursing School, Sydney Dental School, Faculties of Engineering and IT, Health Sciences, and Science, Charles Perkins Centre, Marie Bashir Institute

Discover where research at the University of Sydney can lead you.

Learn more about our research areas, as well as current opportunities online.

sydney.edu.au/research
Children’s Medical Research Institute (CMRI) pioneered microsurgery, immunisations against lethal childhood illnesses and care for premature babies, all of which has improved the lives of countless Australian children over the last 50 years. Today, CMRI is the site of world-leading basic and translational research in the areas of cancer, neurobiology, embryology, genetics and gene therapy.

CMRI collaborates with scientists all over the world to push research forward. It also provides important resources for scientists in Australia. It operates CellBank Australia™, the only national repository of cell lines, necessary for many fields of medical science.

In addition, CMRI houses a Bioinformatics Unit, a major Biomedical Proteomics facility, and an Australian first, the ACRF Centre for Kinomics, a joint venture with the University of Newcastle, which combines medicinal chemistry, Kino-Click™ bead technology and advanced mass spectrometry in order to enable scientists to understand the master controls governing basic cell behaviour and develop new therapeutic drugs for a range of diseases.

Recently added facilities include: The ACRF Telomere Analysis Centre containing six cutting edge microscopes for live cell imaging, automated metaphase scanning, and high resolution fluorescence microscopy; the Vector and Genome Engineering Facility, which makes use of the latest DNA editing technology for a wide range of research and gene therapy; and ProCan® a world-first in cancer proteomics.

The Institute employs more than a hundred full time scientists and educates dozens of PhD students (the ground-breaking scientists of the future) through its academic ties to the University of Sydney.

CMRI’s achievements are made possible by a network of devoted community supporters, as well as the iconic Jeans for Genes® fundraising campaign.

For more information on our PhD Research Award visit: cmri.org.au/Research/For-Students/CMRI-PhD-research-award.aspx

We also offer projects via the Sydney Medical School Summer Research Scholarship: sydney.edu.au/medicine/study/scholarships/summer-research/projectsbylocation.php#cmri
The Kids Research Institute (KRI) is the research institute of the Sydney Children’s Hospitals Network, one of Australia’s largest and most busy paediatric hospitals. Our aim is to improve the lives of sick children through internationally recognised groundbreaking medical research. Here is your chance to work with some of Australia’s leading scientific and medical researchers.

The Kids Research Institute is closely linked to the University of Sydney through the Discipline of Child and Adolescent Health and CHW Clinical School, allowing you to enrol in either honours programs or higher degrees. KRI and the CHW Clinical School have approximately 300 medical researchers and support staff dedicated to finding the causes of, and better treatment for, many childhood diseases.

Our research aims to answer highly clinically relevant and important questions that impact the lives of our children. Students have the opportunity to be involved in research that covers a very wide spectrum of childhood diseases and is divided into seven major research themes: neuroscience and mental health, cancer, infectious diseases & immunity, population health & health services research, genomic rare diseases, chronic diseases of childhood and clinical sciences.

We conduct world leading discovery research into bone diseases, neuromuscular diseases & movement disorders such as cerebral palsy, and work on cures for childhood brain cancers, inheritable rare diseases, and many others.

The Kids Research Institute and CHW Clinical School vision is to be a world-leading translational research centre for children. The outcomes of our research programs are highly translatable to the clinic and community, and have major impacts in terms of childhood disease prevention and improved paediatric care. The strong links that exist between these research groups and clinical, allied health and psychological services at The Children’s Hospital at Westmead mean that the outcomes of our students’ research can be easily translated into the clinical world. This is your chance through your research to make a difference in the health of our children.

At the Kids Research Institute, all Higher Degree students receive continuous support and feedback, as well as an annual progress review from the Postgraduate Team at the CHW Clinical School/Discipline of Child and Adolescent Health, University of Sydney.

**We also offer projects via the Sydney Medical School Summer Research Scholarship:** sydney.edu.au/medicine/study/scholarships/summer-research/projectsbylocation.php#chw
The Westmead Institute for Medical Research and Westmead Hospital

The Westmead Institute for Medical Research is one of Australia’s largest and most productive medical research centres, internationally recognized for its groundbreaking work into many of the most significant diseases affecting humankind.

Housed in an award-winning building, The Westmead Institute’s 400 researchers investigate infectious and immune diseases; cancer and leukemia; liver and metabolic diseases; eye and brain-related disorders and heart and respiratory diseases.

Westmead Hospital is a specialised tertiary referral hospital for the Western Sydney metropolitan area, serving one of the largest growing population areas in NSW. Westmead Hospital has active clinical research being conducted in almost every discipline in medicine, nursing and allied health.

The Westmead Institute and Westmead Hospital offer research opportunities at the University of Sydney Westmead. Most of WIMRs unit directors are clinicians at Westmead Hospital and staff of the University. This allows its research to extend from the laboratory to the patient, using the basic tools of molecular and cell biology, genomics, genetic epidemiology, human and cell imaging technology, cell and gene therapy and clinical research.

The Institute and Hospital’s bench-to-bedside approach has enabled us to achieve greater translation of research from biomedical discovery into new prevention strategies, diagnostics, prognostics, therapies and vaccines.
Cancer

Biochemistry and cell biology of the cancer-associated enzyme telomerase
PhD, Honours, Summer Students

Telomerase is the enzyme responsible for lengthening the ends of chromosomes (telomeres), thereby allowing most cancer cells to divide indefinitely. We are determining the mechanisms of telomerase function using biochemical and cell-based approaches, with the aim of developing telomerase inhibitors as cancer therapeutics.

Supervisors: A/Prof Tracy Bryan, Dr Scott Cohen, Children’s Medical Research Institute

Investigating the role of a novel RNA binding protein in telomerase activity
PhD, Masters, Honours

We have identified a role for a novel RNA binding protein in telomerase biogenesis and recruitment to telomeres. We aim to investigate how this protein functions in this context using fluorescence microscopy and live cell imaging, as well as telomere molecular biology and proteomics approaches.

Supervisor: A/Prof Hilda Pickett, Children’s Medical Research Institute

Identifying the misuse of nucleotide sequence reagents within biomedical research publications
Honours, Summer Students

This project aims to efficiently and reliably identify potentially flawed cancer research publications, and to measure the prevalence and model the consequences of incorrect nucleotide sequence use within the published literature

Supervisor: A/Prof Jennifer Byrne, The Kids Research Institute, The Children’s Hospital at Westmead Clinical School

CTCL proteomics in Formalin Fixed Paraffin Embedded (FFPE) tissue
Honours

In this project we plan to use FFPE tissue from skin biopsies of patients with CTCL and process/analyse them using targeted mass spectrometry-based diagnostic techniques.

Supervisor: A/Prof Fernandez-Penas, Westmead Hospital

Space invaders: How cancer cells negotiate tissue barriers
PhD, Honours

Invasive, metastatic disease is the leading cause of death from cancer. In order to investigate how mechanical forces in the tissue environment regulate cancer cell invasion, our lab employs a range of cell culture models that mimic in vivo tissue and tumour organization, with a focus on brain cancer and neuroblastoma. We have opportunities for enthusiastic students who enjoy problem solving.

Supervisor: A/Prof Geraldine O’Neill, The Kids Research Institute, The Children’s Hospital at Westmead Clinical School

Comparison, validation and characterisation of primary human cutaneous squamous cell carcinoma cells (cSCC) isolated and cultured using different techniques.
Honours

This project aims to compare different techniques of primary cSCC cell isolation and growth determining the most efficient method resulting in representable cSCC cell population. Characterisation and validation of the cells along with comparison to primary cells from adjacent normal skin and to commercially available cell lines will be conducted.

Supervisor: A/Prof Pablo Fernandez-Penas, Westmead Hospital
Proteomic analysis of Stratum Corneum in cutaneous Squamous Cell Carcinoma (SCC)

Honours

In this project we plan to develop a scar-less biopsy method using targeted mass spectrometry-based diagnostic techniques in patients with cuSCC.

Supervisor: A/Prof Pablo Fernandez-Penas, Westmead Hospital
wm.derm.ct@sydney.edu.au

Proteomic analysis of Cutaneous T cell lymphomas (CTCL) using Scarless biopsy

Honours

In this project we aim to develop a scar-less biopsy method using targeted mass spectrometry-based diagnostic techniques on the stratum corneum of the epidermis in CTCL.

Supervisor: A/Prof Pablo Fernandez-Penas, Westmead Hospital
wm.derm.ct@sydney.edu.au

Predictors of chemotherapy response in high-grade serous ovarian cancer

PhD

Subsets of ovarian cancer patients respond well to specific chemotherapeutic agents such as carboplatin, caelyx and paclitaxel, however there are currently no predictive biomarkers to help select those that would benefit. We have identified biomarkers and gene profiles associated with response. This project will determine the validity of response signatures and underlying mechanisms.

Supervisor: Prof Anna deFazio, Westmead Institute for Medical Research
anna.defazio@sydney.edu.au

Interaction between the microbiome, immunological response and systemic treatment in women with ovarian cancer

PhD

Complex microbial communities that colonize the mammalian intestine, known as microbiota, contribute to human health. Individuals vary markedly in their gut microbiota. Microbiota influences inflammation and immunity at a local and systemic level and it has been suggested to contribute to cancer risk and response to therapy. Little is known about the microbiome in ovarian cancer patients.

Supervisor: Prof Anna deFazio, Westmead Institute for Medical Research
anna.defazio@sydney.edu.au

Predictors of endocrine response in high-grade serous ovarian cancer

PhD

A small subset of ovarian cancer patients have been shown to respond well to endocrine therapy, however there are currently no predictive biomarkers to help select those that would benefit from endocrine agents. We have identified a gene profile associated with response in patients. In this project we will determine the validity of the signature and underlying mechanisms.

Supervisor: Prof Anna deFazio, Westmead Institute for Medical Research
anna.defazio@sydney.edu.au

Predictors of endocrine response in low-grade serous ovarian cancer

PhD, Honours

Low-grade serous carcinoma (LGSC) is a subtype of ovarian cancer that tends to occur in younger women and does not respond to current standard chemotherapy. Recent data showed improved survival in LGSC patients on endocrine treatment. However, it is still not clear which endocrine treatments are most effective nor is it possible to predict which patients will respond.

Supervisor: Prof Anna deFazio, Westmead Institute for Medical Research
anna.defazio@sydney.edu.au

Telomere deprotection and cancer

PhD, Honours, Summer Students

Telomeres are the structures at human chromosome ends that regulate cellular aging and tumour suppression. This project will explore how telomeres cooperate with the DNA damage response to control these phenomena.

Supervisor: Dr Tony Cesare, Children’s Medical Research Institute
tcesare@cmri.org.au
Understanding protein dephosphorylation in the DNA damage response

PhD, Masters, Honours

By screening breast cancer samples, we have identified a novel protein phosphatase that regulates DNA repair pathway engagement at telomeres. We aim to investigate the role of this protein in the DNA damage response specifically at telomeres, with the overarching aim to understand how this protein contributes to genome stability and cancer development.

Supervisor: A/Prof Hilda Pickett, Children’s Medical Research Institute
hpickett@cmri.org.au

Identification of correlation and novel binding patterns for transcription factors in liver cancer cell line (HepG2)

Honours, Summer Students

In this project we aim to develop, apply and enhance bioinformatics and statistical tools to effectively collate, query, and mine public data repositories of transcription factor binding data in systematic ways.

Supervisor: Dr Matloob Khushi, Children’s Medical Research Institute
mkhushi@cmri.org.au

The effect of fibroblast cytoplasmic transfer into cancer cells on cancer cell chemosensitivity

Honours

We have discovered cytoplasm exchanges between fibroblasts and cancer cells, and that this correlates with altered cancer cell behavior including: migration; proliferation, cell size and cell shape. The current project is to expand on preliminary observations, initially using a fluorescence activated cell sorting analysis (FACS) to study the relationship between cytoplasmic exchange and chemosensitivity. FACS observations will be strengthened by further single cell tracking studies, to overcome the limitations of analysis of pooled cell populations.

Supervisor: Prof Hans Zoellner, Westmead Hospital
hans.zoellner@sydney.edu.au

Development of a Computer Aided Diagnosis (CAD) technique for early detection of Melanoma

Honours

In this project we are planning to use archived images from our high risk melanoma clinic and develop a Computer Aided Diagnosis (CAD) tool.

Supervisor: Dr Ashnil Kumar, Westmead Hospital
ashnil.kumar@sydney.edu.au

Image processing for understanding cell biology

Masters, Summer Students

In this project we aim to develop novel image and video processing algorithms and pipelines to better understand cell biology.

Supervisor: Dr Matloob Khushi, Children’s Medical Research Institute
mkhushi@cmri.org.au

Comparison of referral, diagnostic and treatment pathways across 12 tumour programs.

Summer Students

The project will assess and compare time frame for referral, diagnosis and treatment of cancers across 12 tumour streams. Using a methodology established by the CINSW, the researcher will audit 20 medical records for each stream and measure timeliness of care along the patient pathway. Team performance will be compared against CINSW and institutional benchmarks and fed back to the teams.

Supervisor: Prof Paul Harnett, Westmead Hospital
paul.harnett@health.nsw.gov.au

Computational prediction of treatment outcome by machine learning

PhD, Masters, Honours

In this project we will implement and develop novel machine learning techniques to predict a best treatment plan for a patient.

Supervisor: Dr Matloob Khushi, Children’s Medical Research Institute
mkhushi@cmri.org.au
Immune cells exhaustion and liver cancer formation in a model of fatty liver disease

**PhD, Masters**

We developed a model of chronic inflammation by a high cholesterol diet that leads to over-stimulation of bone marrow stem cells, and exhaustion of splenic T cells. This leads to the development of liver cancer. In this project, we aim to transplant the bone marrow of mice that chronically have been exposed to a high cholesterol diet and investigate the immune response to liver tumors.

**Supervisor:** Prof Jacob George, The Westmead Institute for Medical Research

*jacoby.george@sydney.edu.au*

---

The DNA replication stress response

**PhD, Honours, Summer Students**

This project will focus on how cells respond to difficulties during DNA replication (i.e. DNA replication stress) and the mechanism of cell death DNA replication stress becomes lethal.

**Supervisor:** Dr Tony Cesare, Children’s Medical Research Institute

*tcesare@cmri.org.au*

---

Drug delivery and release using nanoparticles for oral cancer treatment

**PhD, Masters, Honours**

Nanoparticle-based delivery systems have been recently showed as a promising and a significant improvement in cancer treatment. The aim of this study to develop a novel method using nanoparticles as carriers to deliver cancer drugs to target cancer cells. The initial step for this application will utilize the in vitro delivery of nanoparticles.

**Supervisor:** Dr Ping Ye, Senior Hospital Scientist, Westmead Hospital

*p.ye@sydney.edu.au*

---

Discovery of novel pathways Involved in Chemoresistance in Human Epithelial Carcinoma

**PhD**

Resistance to chemotherapy and metastatic relapse is a hallmark feature of epithelial carcinoma leading to extremely poor patient prognosis. In this project, we will use next generation sequencing to identify pathways involved in chemoresistance and take the initial steps to develop potential drugs for targeted therapy.

**Supervisor:** Dr Naisana Seyedasli, The Faculty of Dentistry

*naisana.seyedasli@sydney.edu.au*

---

Understanding and exploiting differences in cancer cells as novel cancer treatment targets

**PhD**

We use molecular and cellular biology techniques, as well as next generation sequencing, to study many aspects of how cancer cells become immortalised, including the Alternative Lengthening of Telomeres mechanism and inactivation of tumour suppressor genes such as p53. The aim is to find new treatments for cancer.

**Supervisor:** Prof Roger Reddel, Children’s Medical Research Institute

*rreddel@cmri.org.au*

---

HDV infection in the Pathogenesis of Hepatocellular Carcinoma

**PhD, Masters, Honours**

Chronic infection with hepatitis B virus (HBV) causes a significant global health burden. Hepatitis D virus (HDV) infection is acquired either through simultaneous coinfection with HBV or following superinfection of chronic HBV infection. HBV and HDV can inhibit each other’s replication but how this impacts on the host is not clear, so will be addressed in this project, using in vitro models.

**Supervisor:** A/Prof Mark Douglas, Westmead Institute for Medical Research

*mark.douglas@sydney.edu.au*
Cellular constituents defining cell stiffness
Honours

Biomechanics plays an important role in many cellular processes including: migration, cancer invasion, and the response of tissues to mechanical stimuli. We recently published a novel method for studying cell stiffness, in which ‘stiffness fingerprints’ are generated by scanning atomic force microscopy.

In the current project, we will combine our stiffness fingerprint method, with fluorescence labelling of cellular elements considered important for cell stiffness. This will form the basis for numerical models of cell biomechanics at the sub-cellular level.

Supervisor: Prof Hans Zoellner, The Faculty of Dentistry
hans.zoellner@sydney.edu.au

Molecular characterization of cell cycle regulation and epithelial-mesenchymal transition during the initiation phase of epithelial carcinoma
PhD, Masters, Honours

The project will use epithelial carcinoma cell lines and 3D tumour sphere models to study cell cycle dynamics and states of epithelial-mesenchymal transition in cancer cells during tumour homeostasis and in response to treatment.

Supervisor: Dr Naisana Seyedasli, The Faculty of Dentistry
naisana.seyedasli@sydney.edu.au

The role of Bone epithelial carcinoma
PhD, Masters, Honours

The project will use multiple chemo-resistant epithelial carcinoma cell lines and 3D tumour sphere models to dissect the molecular machinery downstream of BMP-induced chemo-resistance.

Supervisor: Dr Naisana Seyedasli, The Faculty of Dentistry
naisana.seyedasli@sydney.edu.au

Investigating cancer cell growth dynamics by live-cell imaging and single-cell tracking
PhD, Masters, Honours

A cancer cell’s fate and behaviour is controlled by interactions between the extrinsic stimuli it receives and the cell’s internal molecular state. Understanding how intrinsic and extrinsic factors control cancer cell fate is a central theme in cancer research. Biologists rely on population snapshots to measure parameters of cell fate and behavior, but while useful in certain contexts, snapshots obscure the detail of single-cell growth dynamics, leading to erroneous conclusions. In contrast, this project applies live-cell imaging and single-cell tracking to study cancer cell growth dynamics at the single cell level.

Supervisor: Dr James Cornwell, Faculty of Dentistry
james.cornwell@sydney.edu.au
Cardiovascular disease

Interplay between diet, retinal pathology and coronary artery disease: innovative strategies to address information gaps

PhD, Masters, Honours, Summer Students

The Australian Heart Eye Study (AHES) is an internationally unique cohort of symptomatic cardiac patients with quantitative coronary angiography and retinal photography data available. This project involves the preparation and detailed analysis of in-depth dietary data in order to investigate the interplay between diet, retinal pathology and coronary artery disease.

**Supervisor:** A/Prof Bamini Gopinath, Westmead Institute for Medical Research

*bamini.gopinath@sydney.edu.au*

---

Therapeutic potential of nanoparticle packaged growth factors in cardiac regeneration

PhD, Honours

The aim of this research is to develop new treatment options for patients with heart failure, using nanoparticle technologies to deliver potential therapies directly to the heart. We are trying to determine whether this will stimulate cardiac stem cells and increase regeneration of the heart muscle after a heart attack.

**Supervisor:** A/Prof James Chong, Westmead Institute for Medical Research

*james.chong@sydney.edu.au*

---

Investigation of Telocyte-like Cardiac Interstitial Cells Using 3D BlockFace Microscopy

Masters, Honours, Summer Students

A 3D blockface electron microscopic images will be used to map the cardiac interstitial cellular network. This will shed light onto the spatial relationships and communication system between telocyte-like CICs and cardiomyocytes, vascular structures, fibroblasts and the conductive system in healthy hearts.

**Supervisor:** Dr Munira Xaymardan, Westmead Hospital, Faculty of Dentistry

*munira.xaymardan@sydney.edu.au*

---

Functional role of procoagulant platelets and monocytes in coronary artery disease

PhD, Honours

Cardiovascular disease remains a public health priority. Thrombosis of atherosclerotic coronary arteries is the main mechanism behind the acute coronary syndromes (ACS). Platelets and monocytes are the crucial cellular determinants of the blood prothrombotic potential, which interacts with the atherosclerotic plaque to initiate thrombosis. The dynamic process of intracoronary thrombus formation in ACS patients is poorly understood. This project aims to evaluate the utility of the coronary thrombus composition and a range of cell-based biomarkers as novel biomarkers of CAD.

**Supervisor:** A/Prof James Chong and Dr Leonardo Pasalic, Westmead Institute for Medical Research

*james.chong@sydney.edu.au, leonardo.pasalic@sydney.edu.au*

---

Role of circulating blood cell-derived extracellular vesicles and miRNAs in Coronary artery disease

PhD, Honours

Recent studies have demonstrated that acute myocardial infarction induces a distinctive miRNA signature, suggesting that miRNAs serve as diagnostic markers. However, various studies investigating this had either small sample size or reported inconsistent results for the same miRNA. Therefore, we aim to investigate the role of circulating blood cell-derived extracellular vesicles and miRNAs in coronary artery disease patients.

**Supervisors:** A/Prof James Chong and Dr Leonardo Pasalic, Westmead Institute for Medical Research

*james.chong@sydney.edu.au, leonardo.pasalic@sydney.edu.au*

---

Monocyte re-programming with increased cardiovascular disease risk

PhD, Masters

Aim: To delineate the altered monocyte state associated with increased biomedical cardiovascular risk factors, in particular determining the gene expression, epigenetic and functional changes that occur.

**Supervisor:** Dr Heather Medbury, Westmead Hospital

*heather.medbury@sydney.edu.au*
Heart repair/regeneration using human stem cell derived cardiomyocytes
PhD, Honours

Heart transplantation is currently the only viable option for patients with advanced heart failure. An exciting possible new therapy is to use stem cells or their derivatives to replace damaged heart tissue. We have established feasibility of pluripotent stem cell derived cardiomyocyte transplantation in pre-clinical models and are working to optimize the efficacy and safety of this novel therapy.

**Supervisor:** A/Prof James Chong, Westmead Institute for Medical Research

james.chong@sydney.edu.au

---

The anti-apoptotic activity of serum albumin for endothelium
PhD

We earlier discovered that serum albumin inhibits endothelial apoptosis, and this has clinical implications for wound healing and vascular disease. A yeast expression system will be used to manufacture recombinant and modified albumin fragments to identify the protein domain inhibiting endothelial apoptosis. Recombinant active fragment will then be used to identify the endothelial receptor.

**Supervisor:** Prof Hans Zoellner, The Faculty of Dentistry

hans.zoellner@sydney.edu.au

---

Monocyte metabolism with increased cardiovascular disease risk.
Honours

To assess whether cardiovascular risk factors drive changes in monocyte metabolic function.

**Supervisor:** Dr Heather Medbury, Westmead Hospital

heather.medbury@sydney.edu.au
Genetic Disease

Building bone strength in brittle bone disease
Honours

The goal of this project is to test a novel combination of bone drugs to treat a model of brittle bone disease. These drugs are already in clinical use and this therapy can be translated rapidly to patients.

**Supervisor:** A/Prof Aaron Schindeler, The Kids Research Institute, The Children’s Hospital at Westmead Clinical School

[aaron.schindeler@sydney.edu.au](mailto:aaron.schindeler@sydney.edu.au)

Using latest innovations in Genomics in the hunt for new disease genes and improved diagnosis for patients with inherited Neuromuscular Disorders

PhD, Masters, Honours, Summer Students

There are >400 genes that cause inherited nerve and muscle disorders. This project will use new technologies to study whole exome sequencing, whole genome sequencing and/or RNA sequencing to identify the genetic basis of disease in children with inherited neuromuscular diseases. Laboratory studies will then be carried out to support the pathogenicity of likely disease-causing variants identified.

**Supervisor:** A/Prof Sandra Cooper (co-supervisor may be primary supervisor), The Kids Research Institute, The Children’s Hospital at Westmead Clinical School

[sandra.cooper@sydney.edu.au](mailto:sandra.cooper@sydney.edu.au)

Improve survival from infection, muscular dystrophy, cardiac and brain injury through understanding the emergency cell survival mechanism of membrane repair

PhD, Masters, Honours, Summer Students

Our research into the mechanism of disease in a rare muscular dystrophy has elucidated the molecular steps to repair a membrane injury: a pathway important for MANY cells and tissues. We know this pathway is important for survival of heart cells from a heart attack, and this project seeks to specifically test the role of this pathway in cellular defense from pore-forming proteins during infection.

**Supervisor:** Dr Frances Lemckert, The Kids Research Institute, The Children’s Hospital at Westmead Clinical School

[frances.lemckert@sydney.edu.au](mailto:frances.lemckert@sydney.edu.au)

Genomics, novel mechanisms and therapies in human disease

PhD, Masters, Honours, Summer Students

Genomics and phenotypic analyses are used to prioritise novel candidate disease genes and broaden knowledge of disease burden in patients with blinding eye conditions such as retinitis pigmentosa, glaucoma and associated systemic disorders. This facilitates use of functional studies to investigate genes and pathways causing blindness, and development of therapies for these conditions.

**Supervisor:** Prof Robyn Jamieson, The Kids Research Institute, The Children’s Hospital at Westmead Clinical School

[rjamieson@cmri.org.au](mailto:rjamieson@cmri.org.au)

Maternal KIRs and fetal HLA C genotype and its association with the risk of preeclampsia and IUGR

Honours, Summer Students

This project will investigate whether maternal activating KIRs (KIR2DS1) genes, expressed on uNK cells, are associated with reproductive failure such as preeclampsia and IUGR mediated by fetal HLA-C2 by genotype.

**Supervisor:** Dr Indika Alahakoon, Westmead Hospital

[indika.alahakoon@health.nsw.gov.au, thushari.alahakoon@sydney.edu.au](mailto:indika.alahakoon@health.nsw.gov.au, thushari.alahakoon@sydney.edu.au)

Head Development: Intersection of transcriptional and signalling activities

PhD, Honours

This project is designed to test the hypothesis that head formation during embryogenesis is controlled by a multitude of interacting transcriptional and signalling activities, and that the severe phenotypic consequence of the perturbation of these activities will place them at a critical intersection for directing cell differentiation and tissue patterning.

**Supervisor:** Prof Patrick Tam, Children’s Medical Research Institute

[ptam@cmri.org.au](mailto:ptam@cmri.org.au)
Consanguinity and fetal anomaly in Western Sydney Health District: a 10 year retrospective data analysis
Masters, Honours
Literature review for congenital anomaly and consanguinity. Data cleaning and analysis of electronic obstetric maternal database
Supervisor: Dr Indika Alahakoon, Westmead Hospital
indika.alahakoon@health.nsw.gov.au, thushari.alahakoon@sydney.edu.au

Using the power of gene-editing to study the function of a new disease gene that highlights oxidative distress as a core mechanism in the myopathies that is amenable to treatment
PhD, Masters, Honours, Summer Students
We have identified a new gene that causes an infantile myopathy - PYROXD1. PYROXD1 is an oxidoreductase that rescues cells from a lethal oxidative injury, and cells and animals can’t exist without its activity. We are using gene editing, patient and mouse proteomics, and redox assays to find out what PYROXD1 does and what its vital substrates are that need to be reduced for cellular life to exist.
Supervisor: Dr Fran Evesson, The Kids Research Institute, The Children’s Hospital at Westmead Clinical School
frances.evesson@sydney.edu.au

Differentiation of tongue-like myocytes from cardiogenic progenitors derived from human pluripotent stem cells (hPSCs) by modulation of Notch and Wnt signalling pathway
PhD, Masters, Honours, Summer Students
It is intriguing that the developmental origin of the tongue is closely related to the cardiomyocytes but not the skeletal myocytes. Tongue muscle possess both cardiac and skeletal genes to become a hybrid type. This phenomena is previously unrecorded hence investigation of the underpinning mechanism will have a significant impact on the concept of orofacial muscle development and repair.
Supervisor: Dr Munira Xaymardan, Westmead Hospital, Faculty of Dentistry
munira.xaymardan@sydney.edu.au

Airway responses to hypertonic solutions reveal a new physiological defect in cystic fibrosis.
PhD
This project will use well-established, clinically relevant techniques - the nasal potential difference, nasal resistance and nasal mucociliary clearance, to examine the responses to hypertonic solutions. As these are abnormal in CF, better understanding of these differences will lead to better understanding of CF pathophysiology and perhaps new therapies based on these findings
Supervisor: A/Prof Peter Middleton, Westmead Institute for Medical Research
peter.middleton@sydney.edu.au

Control of cell differentiation during mouse embryogenesis and stem cell development
PhD, Honours
The research will provide insights into how progenitor cells for embryonic tissues may be specified and determine the conditions that promote differentiation into germ layer derivatives. The outcome will inform us on the molecular and signalling activities that control the first step of differentiation of multi-potent embryonic cells and stem cells to functionally competent cells.
Supervisor: Prof Patrick Tam, Children’s Medical Research Institute
ptam@cmri.org.au

Investigation of the Role of Transcription Factor Nkx2-5 and Its Network Regulation in Orofacial Muscle Development – Tongue as a model
PhD, Masters, Honours, Summer Students
The tongue is the only site that cardiac and skeletal muscle transcription factors coexpress, enabling the generation of a conditional knockout mouse model to analysis the role of the cardiac transcription factor Nkx2-5 in this extra-cardiac region. This work is a collaboration between Xaymardan lab and Jackson laboratory in Maine USA, which is a core world centre for GM organisms.
Supervisor: Dr Munira Xaymardan, Westmead Hospital, Faculty of Dentistry
munira.xaymardan@sydney.edu.au
2DL1 and 2DS1 KIRs gene mutational screening for preeclampsia and IUGR patients

Honours, Summer Students

We will examine genetic variations of two maternal KIRs gene: 2DL1 and 2DS1, which interact with fetal HLA-C epitopes in preeclampsia and IUGR patients.

**Supervisor:** Dr Indika Alahakoon, Westmead Hospital
indika.alahakoon@health.nsw.gov.au; thushar.alahakoon@sydney.edu.au

Pathways to therapies in blinding genetic eye diseases

PhD, Honours

Genomic approaches are used in disease gene and variant discovery, especially for genetic causes of blindness. Cellular, genome engineering, proteomic and animal model study are used for functional analyses and to develop new therapies for these disorders.

**Supervisor:** Prof Robyn Jamieson, Children’s Medical Research Institute
rjamieson@cmri.org.au

Development of novel viral vectors for genome editin

PhD

We work towards the understanding of the basic biology, but also translational development of novel gene therapy vectors and gene editing tools targeting multiple tissues, including liver, hematopoietic system and central nervous system.

**Supervisor:** Dr Leszek Lisowski, Children’s Medical Research Institute
llisowski@cmri.org.au

Exploring the genomic landscape of skeletal dysplasias

PhD, Masters, Honours

Skeletal dysplasias are rare genetic disorders causing skeletal deformities. This project involves the detailed clinical and genomic characterisation of patients with skeletal dysplasias to better understand the genetic factors underlying skeletal development.

**Supervisor:** Prof Andreas Zankl, The Kids Research Institute, The Children’s Hospital at Westmead Clinical School
andreas.zankl@sydney.edu.au

The Genetics of Paediatric Bone Fragility Disorders

PhD, Masters, Honours

Advances in whole genome sequencing have led to the identification of new genes involved in childhood brittle bone disease. Genetic variants of unknown significance are often identified but their influence remains unclear. CRISPR/Cas9 gene editing, in combination with iPS cells and bone cell culture, will be used to examine the function of new genes and the impact of novel gene variants.

**Supervisor:** Dr Andrew Biggin, The Kids Research Institute, The Children's Hospital at Westmead Clinical School
andrew.biggin@health.nsw.gov.au

Gene therapy for genetic and acquired diseases of the liver and haematopoietic system

PhD, Honours

The Gene Therapy Research Unit has a diverse selection of projects available that can be tailored for honours or PhD student. All projects focus on the development and use of gene transfer and genome editing technology.

**Supervisor:** Prof Ian Alexander, Children’s Medical Research Institute

**Co-Supervisors:** Dr Samantha Ginn, Dr Sharon Cunningham, Dr Claus Hallwirth, Dr Grant Loga
ian.alexander@health.nsw.gov.au

Gene Identification and Treatment in Genetic Kidney Disease

PhD, Honours

This project is evaluating the animal model of human kidney disease: Atypical Haemolytic Uremic Syndrome (HUS).

HUS is a disease that leads to kidney damage by activation of the complement pathway. The commonest cause is mutations in the regulatory gene CFH. We have mice with a minor mutation and will assess for the development of kidney disease and treat these mice by gene therapy.

**Supervisor:** Prof Stephen Alexander, The Kids Research Institute, The Children’s Hospital at Westmead Clinical School
stephen.alexander@health.nsw.gov.au
Immunity

Exploring the immune regulatory mechanisms in oral peanut immunotherapy for the treatment of peanut allergy

**PhD, Masters, Honours**

This project aims to characterize general and specific changes in the immune system during peanut oral immunotherapy

**Supervisor:** Dr Peter Hsu, The Kids Research Institute, The Children’s Hospital at Westmead Clinical School  
**Email:** peter.hsu@health.nsw.gov.au

---

Exploring T cell responses in antibody-associated brain diseases in children

**PhD, Masters, Honours**

Autoantibodies against brain proteins, such as neurotransmitter receptors, have been identified in children affected by movement and psychiatric disorders, and are valuable diagnosis tools. However, there probably is a crosstalk between T and B cells, important for pathogenesis. This research project will explore T cell responses produced in these children.

**Supervisor:** A/Prof Fabienne Brilot-Turville, The Kids Research Institute, The Children’s Hospital at Westmead Clinical School  
**Email:** fabienne.brilot@sydney.edu.au

---

Understanding the pathogenesis of Food Protein Induced Enterocolitis Syndrome (FPIES)

**PhD, Masters, Honours**

This project aims to explore the potential cellular/immunological mechanisms for the enigmatic food induced reactions in FPIES

**Supervisor:** Dr Peter Hsu, The Kids Research Institute, The Children’s Hospital at Westmead Clinical School  
**Email:** peter.hsu@health.nsw.gov.au

---

Inflammation in the kidney

**PhD, Honours**

Inflammation is a crucial component of acute kidney injury and contributes significantly to overall cellular damage. Recently my group has been able to identify important genes and inflammatory cells that play a role in orchestrating this inflammation. This project will used specially modified cells and drugs in a mouse model of acute kidney injury to test whether we can reduce injury.

**Supervisor:** Dr Natasha Rogers, Westmead Hospital  
**Email:** natasha.rogers@health.nsw.gov.au

---

Targeting Regulatory T Cells for the Treatment of Autoimmune Kidney Disease and Renal Rejection

**PhD, Honours**

We will use Chimeric Antigen Receptors (CARs) to develop antigen specific regulatory T cells, which include a fusion protein of scFv derived from PLA2R and HLA-A2 antibodies targeted to specific kidney antigens. The purpose of the CARs Treg modification is to expand and stimulate antigen-specific Tregs, which have been suggested to have stronger immune suppressive function than polyclonal Tregs.

**Supervisor:** Prof Stephen Alexander, The Kids Research Institute, The Children’s Hospital at Westmead Clinical School  
**Email:** stephen.alexander@health.nsw.gov.au

---

Induction of immune tolerance using a lentivirus system for the treatment of Type 1 diabetes

**PhD, Masters**

Transfect pancreatic beta cell islets with lentiviral constructs and then examine their survival in a mismatched HLA host

**Supervisor:** Prof Nicholas Manolios, Westmead Hospital  
**Email:** nicholas.manolios@sydney.edu.au
Exploring the mechanism of immune dysregulation in primary immune deficiencies
PhD, Masters, Honours

This project aims to elucidate the mechanisms by which various genetic defects in the immune system might cause impaired regulation of the immune system, in addition to defective immune defense.

Supervisor: Dr Peter Hsu, The Kids Research Institute, The Children’s Hospital at Westmead Clinical School
peter.hsu@health.nsw.gov.au

The role of ion channels in cytokine regulation
PhD

We have identified a number of peptide compounds able to block ion channels and influence cytokine production. The project will define what is the mechanism of action by which these peptides influence cytokine production and thereby immune function.

Supervisor: Prof Nicholas Manolios, Westmead Hospital
nicholas.manolios@sydney.edu.au

Role of IL-7 and IL-7/anti-IL-7 Antibody Complexes in Treg Expansion in Vitro and in Vivo a Murine Skin Transplant Model
PhD, Honours

The study aims to investigate the role of IL-7 in supporting CD4+Foxp3+ Treg survival in the alloimmune response and whether IL-7/anti-IL-7mAb complexes expanded Foxp3 Tregs contain memory-Tregs.

Supervisor: Dr Min Hu, Westmead Institute for Medical Research
min.hu@sydney.edu.au

Glomerular Podocyte Injury and Repair Mechanisms
PhD, Honours

Podocytes are key cells in the glomerulus for protein filtration. Many diseases of the kidney involve injury to the podocyte. Focal segmental glomerulosclerosis (FSGS) is one of the most common causes of nephrotic syndrome in children and adults. In this project, human conditionally immortalized podocytes (ciPods) cells will be cultured and analyzed with or without plasma from FSGS patients.

Supervisor: Prof Stephen Alexander, The Kids Research Institute, The Children’s Hospital at Westmead Clinical School
stephen.alexander@health.nsw.gov.au

Trackin t Tolerant Model
Honours

Regulatory T cells (Tregs) play very import role in transplant tolerance. We have established an islet transplant tolerance model and have Foxp3 GFP reporter mice. This study will study migration of Foxp3 Tregs after transplantation.

Supervisor: Dr Min Hu, Westmead Institute for Medical Research
min.hu@sydney.edu.au
Infectious disease

**Investigating the mechanism of sexual transmission of HIV**

**PhD, Masters, Honours, Summer Students**

This project will investigate sexual transmission of HIV using fresh human tissue. Tissue will either be sectioned for microscopy of enzymatically digested to isolate immune cells (especially HIV target cells). These cells will then be functionally characterised and also treated with HIV.

**Supervisor:** A/Prof Andrew Harman, Westmead Institute for Medical Research

*andrew.harman@sydney.edu.au*

---

**Synergetic effects of antibiotics for the treatment of multidrug resistant Gram-negatives**

**Honours**

The determination of the natural distribution of synergistic antibiotic concentrations required for inhibition of Gram-negative bacteria, using molecular and clinical microbiology techniques to define resistance genotype-phenotype relationships.

**Supervisor:** Dr Andrew Ginn, Institute of Clinical Pathology and Medical Research

*andrew.ginn@health.nsw.gov.au*

---

**How do herpes simplex viruses interact with dendritic cells in human skin: clues for vaccine development**

**PhD**

This project will study the initial interactions of herpes simplex virus with epidermal and dermal subsets of dendritic cells, and determine how the virus is recognised, taken up and processed by these cells. The importance of each subset in stimulating CD4 and CD8 T cell responses will also be assessed.

**Supervisor:** Prof Anthony Cunningham, The Westmead Institute for Medical Research

*tony.cunningham@sydney.edu.au*

---

**Distribution of Intracellular MICs against Salmonella Typhimurium**

**Honours**

Antibiotic resistance in the Salmonellae is increasing rapidly, and resistance in Salmonella is considered to be a critically important antimicrobial resistance which is monitored locally and internationally. Unfortunately, it is well known that the minimum inhibitory concentration (MIC) determined in diagnostic laboratories for drugs like penicillins do not correlate with in vivo efficacy. This project will compare the relationship of the MIC methods used in clinical microbiology laboratories with the MIC achievable after internalisation of the Salmonella Typhimurium in tissue culture and will generate definitive intracellular MICs that are thought to be more relevant to clinical efficacy for this intracellular pathogen. Students will have the opportunity to collaborate in a large public health laboratory (ICPMR) and research facility (WIMR) and learn molecular biology and tissue culture techniques. A highly dedicated student will advance our knowledge in this area, and provide valuable information on changes in resistance patterns, and therapeutic options, in this endemic pathogen.

**Supervisor:** Dr Andrew Ginn, Institute of Clinical Pathology and Medical Research

*andrew.ginn@health.nsw.gov.au*

---

**Defining the mechanism of assembly of herpes simplex virus in the neuronal growth cone and its subsequent exit to epithelial cells**

**PhD, Masters, Honours**

Our aim is to define how herpes simplex virus (HSV-1) travels and exits nerve cells. We have shown that the viral protein pUS9, which is present in the virus envelope, is essential for virus assembly at the nerve tips. We aim to define the role of the pUS9 protein and identify viral and/or cellular proteins interacting with pUS9 during HSV-1 transport along nerves and assembly at the nerve tips.

**Supervisor:** Dr Monica Miranda-Saksena, The Westmead Institute for Medical Research

*monica.miranda@sydney.edu.au*
Chronic Infections in Cystic Fibrosis: Exploring a New Treatment Paradigm

PhD

Bacterial infections progressively damage the lungs in Cystic Fibrosis, eventually causing death from respiratory failure in most patients. These infections are rarely eradicated. In pilot studies, we have shown effective antibiotic and non-antibiotic combinations for otherwise resistant bacteria. This PhD will explore this further.

Supervisor: A/Prof Peter Middleton, Westmead Institute for Medical Research

peter.middleton@sydney.edu.au

Genomics dissection and prevention of bacterial transmission events

PhD

This project will advance the control of infectious diseases by applying genomics techniques to examine microevolutional dynamics and transmission networks among successful clones of Salmonella and apply detection of genomic variation to measure the impact of preventative interventions.

Supervisor: A/Prof Vitali Sintchenko, Westmead Institute for Medical Research

vitali.sintchenko@sydney.edu.au

Role of Arg1 kinase in fungal virulence and as an antifungal drug target

PhD, Masters, Honours, Summer Students

We discovered that Arg1 is the lead kinase in a signalling pathway essential for the virulence of C. neoformans (Cn). Without Arg1, Cn is cleared from lung in a mouse model and fails to cause meningitis. Arg1 is therefore a promising drug target. Projects are available to determine the role of Arg1 in producing numerous fungal virulence traits and to identify selective Arg1 inhibitors.

Supervisor: A/Prof Julie Djordjevic, Westmead Institute for Medical Research

julianne.djordjevic@sydney.edu.au

Role of monocyte subsets and HIV co-infection in cryptococcal meningitis

PhD, Masters, Honours, Summer Students

Cryptococcus neoformans (Cn) employs monocyte-assisted crossing of the blood brain barrier (BBB) to cause life-threatening meningitis in HIV/AIDS patients. The aims are to determine whether monocyte subsets that predominate during HIV infection, transport Cn across an in vitro BBB model, and whether Cn transmigration within these monocyte subsets is facilitated by HIV co-infection.

Supervisor: A/Prof Julie Djordjevic, Westmead Institute for Medical Research

julianne.djordjevic@sydney.edu.au

Role of the phosphate acquisition (PHO) pathway in cryptococcal meningitis

PhD, Masters, Honours, Summer Students

We showed that C. neoformans (Cn) activates its PHO signaling pathway to acquire phosphate from the host and promote tolerance to the immune system. We also showed that blocking the PHO pathway prevents cryptococcal infection of the brain (meningitis) in a mouse model. This project will identify key components in the PHO pathway that may be suitable as antifungal drug targets.

Supervisor: A/Prof Julie Djordjevic, Westmead Institute for Medical Research

julianne.djordjevic@sydney.edu.au

Do successful clones of Legionella pneumophila strains display superior fitness and persistence? Using a new outbreak clone (ST211) to discern the fitness parameters of L. pneumophila serogroup 1

Honours

This project will investigate key persistence features of L. pneumophila and design assays for pathogen fitness to create the link between genomic surveillance and pathogen virulence. An emerging outbreak clone isolated in the recent Sydney outbreaks and carrying a unique T4SS will be used to answer key questions related to persistence and relevance to public health prevention and control.

Supervisor: A/Prof Vitali Sintchenko, Westmead Hospital

vitali.sintchenko@sydney.edu.au

Role of the phosphate acquisition (PHO) pathway in cryptococcal meningitis

PhD, Masters, Honours, Summer Students

We showed that C. neoformans (Cn) activates its PHO signaling pathway to acquire phosphate from the host and promote tolerance to the immune system. We also showed that blocking the PHO pathway prevents cryptococcal infection of the brain (meningitis) in a mouse model. This project will identify key components in the PHO pathway that may be suitable as antifungal drug targets.

Supervisor: A/Prof Julie Djordjevic, Westmead Institute for Medical Research

julianne.djordjevic@sydney.edu.au
Vaccine safety and effectiveness in Australian children

PhD, Masters

In this higher degree students will focus on the effectiveness and safety (both immunological and clinical) of vaccines used in our Australian national immunisation program. This includes analysis of an active safety surveillance system (which uses internet and smartphone based technologies) and analysis of clinical trial data.

Supervisor: A/Prof Nicholas Wood, The Kids Research Institute, The Children’s Hospital at Westmead Clinical School

nicholas.wood@health.nsw.gov.au

Characterisation of clinical isolates of Porphyromonas gingivalis and Aggregatibacter actinomycetemcomitans from dental plaque of rheumatoid arthritis patients

Honours, Summer Students

Certain oral organisms have been implicated in the initiation of rheumatoid arthritis through various mechanisms. Obtaining clinical isolates of bacteria from these patients will be critical in determining pathogenic traits of these strains.

Supervisor: A/Prof Ky-Anh Nguyen, The Faculty of Dentistry

ky-anh.nguyen@sydney.edu.au

Mutagenesis study of LptO - a essential component of Type IX secretion system in Porphyromonas gingivalis

Masters, Honours

Type IX secretion system is essential for the export of important virulence proteins from the periodontal pathogen, Porphyromonas gingivalis and related bacteria. This study aims to identify critical functional regions within the protein LptO in this system using deletional mutagenesis and site-directed mutagenesis.

Supervisor: A/Prof Ky-Anh Nguyen, The Faculty of Dentistry

ky-anh.nguyen@sydney.edu.au

Comparative and binding analysis of the bacterial HusA haemophore homologs to explore the function evolution of periodontal pathogen Porphyromonas gingivalis

Honours

Haem is an essential nutrient for Porphyromonas gingivalis and it uses HusA to scavenge this nutrient from the host red blood cells. By looking at the evolution of HusA protein in domesticated species, a history of host colonisation maybe ascertained.

Supervisor: Dr Jinlong Gao, The Faculty of Dentistry

jinlong.gao@sydney.edu.au

HPV School Based Vaccination of Adolescents

PhD, Masters, Honours,

HPV vaccination of adolescents has had achievements; but coverage is lower than ideal. We have conducted a large scale evaluation of school vaccination with quantitative and qualitative data from a range of sources. This project aims to investigate 1) correlates of lower or higher coverage across schools and individual students and 2) knowledge, attitudes and experience of adolescents, parents and providers.

Supervisor: Prof Rachel Skinner, The Kids Research Institute, The Children’s Hospital at Westmead Clinical School

rachel.skinner@health.nsw.gov.au

Tuberculosis in children and the rise of drug-resistant disease

PhD, Masters

Tuberculosis is the number one infectious disease killer on the planet with rising rates of drug-resistant disease, especially in the Asia-Pacific region. Children are heavily impacted in settings with ongoing tuberculosis transmission. Clinicians/researchers with an interest in tuberculosis (any aspect), global child health or pathogen genomics are welcome to contact me to explore options.

Supervisor: Prof Ben Marais, The Kids Research Institute, The Children’s Hospital at Westmead Clinical School

ben.marais@health.nsw.gov.au
Q fever: research to inform Australia’s vaccine policy

**PhD and Masters**

Q fever is a ubiquitous zoonotic disease of worldwide importance. It has special significance for Australia, where the causative organism Coxiella burnetii was discovered, and the only country using a vaccine, QVax. Our previous NHMRC Project Grant identified three previously unknown but critical pieces of information. First, the burden of Q fever in young adults (< 20 years old) was higher than previously thought, second, immunity (both antibody and cellular) was nearly completely absent 10 years after Q fever vaccination and third, adverse events following Q fever vaccine in 17 to 20 year olds (predominantly females) was documented for the first time. These grant findings highlight the need to conduct further research to optimise Australia’s Q fever vaccine policy and improve protection against Q fever. Specifically the student will work on two studies: (1) A world-first prospective multi-centre study to systematically measure the immunogenicity and safety of Q fever vaccine given to children aged 10 to 14 years and (2) explore novel measures to inform immune longevity following Q fever vaccination.

**Supervisor:** A/Prof Nicholas Wood, The Kids Research Institute, The Children’s Hospital at Westmead Clinical School

nicholas.wood@health.nsw.gov.au

---

Antimicrobial coatings to prevent orthopaedic implant infection

**PhD**

The aim of this project is to improve treatment of bone and joint infections, this project will examine the delivery of a new antimicrobial compound via orthopaedic implants.

**Supervisor:** A/Prof Aaron Schindeler, The Kids Research Institute, The Children’s Hospital at Westmead Clinical School

aaron.schindeler@sydney.edu.au
Kidney disease

Vascular complications in kidney disease
Honours
Chronic kidney disease (CKD) is a worldwide public health problem. The most common consequence of CKD is premature and accelerated vascular disease, leading to stroke, heart attacks and early death. The underlying causes of vascular disease are not well described. This project seeks to investigate the role of a new molecular pathway involving a group of ‘stress proteins’ in vascular smooth muscle cells as a significant contributor to vascular disease.

**Supervisor:** Dr Natasha Rogers, Westmead Hospital
natasha.rogers@health.nsw.gov.au

---

Identifying the causes of fibrosis after kidney transplantation
PhD
We have identified a 13 gene set that predicts renal transplant fibrosis and graft loss in patients. Interestingly some of these genes are donor as well as recipient related. In this project we aim to investigate these gene pathways in cell lines and animal models to better understand how the cause of renal fibrosis after transplantation.

**Supervisor:** Prof Philip J. O’Connell, Westmead Institute for Medical Research
philip.oconnell@sydney.edu.au and

---

The role of key driver genes in the pathogenesis of acute renal allograft rejection
PhD
This project aims to identify new treatments for acute kidney transplant rejection. We have identified new gene pathways involved in acute kidney transplant rejection. Drugs approved for use in the clinic of other indications will be tested for their ability to suppress these gene pathways and to see if they may be repurposed for treating acute kidney transplant rejection.

**Supervisor:** Prof Philip J. O’Connell, Westmead Institute for Medical Research
philip.oconnell@sydney.edu.au

---

Kidneytext - improving dietary and lifestyle behaviour in people with chronic kidney disease on haemodialysis using a text message-based intervention
Honours
In the trial we will be evaluating the feasibility and acceptability of a text message intervention to improve dietary and lifestyle behaviours of people on haemodialysis. This will be a 6 month randomised trial conducted over a number of dialysis units across Sydney.

**Supervisor:** Dr Vincent Lee, Westmead Hospital
vincent.lee@sydney.edu.au

---

Biomarkers in kidney disease
Honours
This project will involve examining samples from Indigenous and non-Indigenous patients with kidney disease. Plasma and urine samples will be analyzed for biomarkers and identify whether these are elevated in CKD and if these biomarkers are disproportionately elevated in Indigenous Australians. We hope to be able to identify a marker of CKD, relevant to any population that can be implemented into clinical practice guidelines.

**Supervisor:** Dr Natasha Rogers, Westmead Hospital
natasha.rogers@health.nsw.gov.au

---

Investigating the Role of Intronic SNP of SHROOM3 in Kidney Inflammation and Injury after Renal Ischemia-reperfusion Injury
PhD, Honours
This study aims to investigate the role of an intronic SNP of SHROOM3 (predicted to be pathogenic) in kidney infiltration, injury and fibrosis in mouse model of renal ischemia-reperfusion Injury.

**Supervisor:** Prof Philip J. O’Connell, Westmead Institute for Medical Research
philip.oconnell@sydney.edu.au
**Metabolic**

The role of thrombospondin-1 and CD47 in diabetes

**PhD, Honours**

Diabetes mellitus develops when insulin-producing beta cells in the pancreatic islet are destroyed through immunological attack. Islet transplantation is an effective treatment and remains the only successful cure for type I diabetes. This project will investigate the role of the receptor CD47 and its ligand thrombospondin-1 in promoting islet injury and how this pathway can be intersected to improve islet graft outcomes.

**Supervisor:** Dr Natasha Rogers, Westmead Hospital  
natasha.rogers@health.nsw.gov.au

---

Using the global framework of nutrition to reverse diabetes

**PhD**

Perhaps surprisingly, there is poor understanding of the best diets to try to reverse type 2 diabetes and its precursor impaired glucose tolerance.

We have a range of mouse models of diabetes with or without diet induced obesity. This project will use an array of different diets from the global framework of nutrition to identify the best diet or best diets to reverse type 2 diabetes.

**Supervisor:** Prof Jenny Gunton, Westmead Institute for Medical Research  
jenny.gunton@sydney.edu.au

---

Understanding the development and progression of obesity and metabolic disease risks during puberty and adolescence

**PhD, Masters, Summer Students**

The ARCHER study is a longitudinal study of puberty and adolescent health. The study recently finished 3 years of follow-up, and we have specific interest in examining weight gain, obesity and metabolic disease risk during this period. Research opportunities include analysis of an existing ARCHER database, and lab analysis of blood and genetic markers related to obesity and metabolic disease.

**Supervisor:** Prof Kate Steinbeck, The Kids Research Institute, The Children’s Hospital at Westmead Clinical School  
kate.steinbeck@health.nsw.gov.au

---

Application of Mediterranean Diet among culturally diverse population groups of Western Sydney

**Masters, Honours**

This research study will investigate the Mediterranean Diet and the application of Med Di principles among ethnically diverse populations of Western Sydney.

**Supervisor:** Prof Vicki Flood, Westmead Hospital  
vicki.flood@sydney.edu.au

---

Assessment of vitamin D status in the neonate using dried blood spots: a step closer to accurate epidemiological analysis

**PhD**

Neonatal vitamin D deficiency places an infant at risk of rickets, hypocalcaemic seizures, developmental delay and potentially increases the likelihood of childhood cancer and type 1 diabetes mellitus. The early detection and treatment of vitamin D deficiency therefore has the potential to significantly improve short- and long-term health. The aim of this project is to develop Vit D metabolites assay using Tandem Mass Spectrometry and using this assay to investigate for an association between neonatal vitamin D concentrations and the development of childhood cancer or type 1 diabetes. Initially Scholarship is available for up to two years and possibility of obtaining funds for another 18 months.

**Supervisors:** A/Prof Craig Munns, Dr Sundar K, Dr Andrew Biggin, Jenny Lee and A/Prof Veronica Wiley, The Kids Research Institute, The Children’s Hospital at Westmead Clinical School  
craig.munns@health.nsw.gov.au
Neurobiology

Profiling retinal structural and blood flow changes in Alzheimer’s disease
PhD, Masters, Honours, Summer Students

This project will use new and improved retinal imaging technology to obtain detailed and integrated retinal image analysis (i.e. multimodal approach) which will provide meaningful information about the brain in health and disease. This research project is imperative in helping to establish the true clinical utility of these imaging tools in dementia.

**Supervisor:** A/Prof Bamini Gopinath, Westmead Institute for Medical Research

bamini.gopinath@sydney.edu.au

Molecular mechanisms of nerve communication
PhD

We are determining the molecular mechanisms of nerve communication at the synapse to understand epilepsy, schizophrenia and intellectual disabilities. We use the world’s most cutting edge technologies, including advanced proteomics, protein chemistry, molecular biology, cell biology, gene editing and drug discovery approaches.

**Supervisor:** Prof Phil Robinson, Children’s Medical Research Institute

probinson@cmri.org.au

Understanding the neural mechanisms of Lisdexamfetamine dimesylate (LDX) pharmacotherapy in Binge-Eating Disorder
PhD

While Lisdexamfetamine dimesylate (LDX) is indicated for moderate to severe binge-eating disorder (BED), the exact mode of its therapeutic action in BED remains unknown. This project involves conducting a pre-post treatment study which aims to provide a comprehensive understanding of the neural mechanisms by which LDX improves symptoms of BED.

**Supervisor:** Dr Kristi Griffiths, Westmead Institute for Medical Research

kristi.griffiths@sydney.edu.au

Discovery and analysis of signalling pathways and mechanisms underlying learning and memory
PhD

This project will aim to discover and validate new molecular mechanisms of how synaptic plasticity is regulated by protein interactions at the neurotransmitter release sites and phosphorylation-based signalling.

**Supervisor:** Dr Mark Graham, Children’s Medical Research Institute

mgraham@cmri.org.au

Investigation of synaptic mechanisms related to brain plasticity
Honours

This project aims to discover and validate new molecular mechanisms that change synaptic function in response to neuronal activity, thereby regulating the level of neurotransmitter release. In particular, regulation by protein interactions, protein kinases/ phosphatases and downstream phospho-signalling. These mechanisms underlie learning and memory and can provide new therapeutic targets.

**Supervisor:** Dr Mark Graham, Children’s Medical Research Institute

mgraham@cmri.org.au

Using technology and to identify phenotypes to better inform and monitor treatment in youth disorders
PhD, Honours

Through the use of already available technology such as Fitbits and smart phones, young people are able to provide a wealth of physiological and experiential information about their daily lives. This project aims to capture ‘digital phenotypes’ from help-seeking youth in order to better inform mental health assessments, aid in personalised treatment selection, and track treatment success.

**Supervisor:** A/Prof Michael Kohn, Westmead Institute for Medical Research

michael.kohn@health.nsw.gov.au
Developing gene correction therapy to treat neurological disorders

**PhD**

Mutations in MECP2 cause Rett syndrome. Novel Adeno-associated virus (AAV) variants will be identified and used to deliver CRISPR gene editing tools into neuronal cells of a Rett syndrome mouse model with the aim of permanently correcting the mutation in MECP2 back to wild type.

**Supervisor:** Dr Wendy Gold, The Kids Research Institute, The Children's Hospital at Westmead Clinical School

*wendy.gold@sydney.edu.au*

---

A systematic review of nutrition interventions among people with Motor Neuron Disease

**Masters, Honours**

This project will involve conducting a detailed literature review and assessing quality of the literature, on the topic of nutrition and MND. This will contribute to other work we are currently undertaking of nutrition trials among people with this progressive neurological disease.

**Supervisor:** Prof Vicki Flood, Westmead Hospital

*vicki.flood@sydney.edu.au*
**Specialty**

**Exploring the antibacterial potential of oxalate nanocrystal in dentistry**

**Honours, Summer Students**

We recently discovered that potassium oxalate nanocrystals presented antibacterial property on cariogenic pathogens in vitro. This project is to further characterise the mechanism of the antibacterial action using advanced microscopy techniques. The cell toxicity of this biomaterial will be also evaluated in this study.

**Supervisor:** Dr Jinlong Gao, Westmead Hospital  
jinlong.gao@sydney.edu.au

---

**Sexuality in men/fathers during pregnancy and in the first year after childbirth**

**PhD**

This will be a cross-sectional mixed methods study. Men whose partners are either pregnant or have given birth during past 12 months will be invited to participate in this study. A multi-section questionnaire will be used to collect information concerning demographics, medical history and sexual life as well as their partner’s obstetrics and gynaecological history and baby’s characteristics. In addition, standardised validated questionnaires will be used to measure sexual function, mental health and quality of relationships in the men/fathers. Further to these, they will be asked open-ended questions about the effect of pregnancy and childbirth on their sexual function, mental health and relationships.

**Supervisor:** Dr Marjan Khajehei, Westmead Hospital  
marjan.khajehei@health.nsw.gov.au

---

**Transition in Chronic Illness. Support for competitive scholarship application**

**PhD, Masters**

Adolescents with chronic illness face challenges transitioning from paediatric to adult care. Research opportunities include: (a) Data analysis and outcomes of the current transition programs – Trapeze and Transition Network Agency for Clinical Innovation; (b) RCT of the newly developed, “TransitionMate” app to support the transition process after discharge from paediatric care.

**Supervisor:** Prof Kate Steinbeck, The Kids Research Institute, The Children’s Hospital at Westmead Clinical School  
kate.steinbeck@health.nsw.gov.au

---

**Ethics of research in adolescence**

**PhD, Masters**

This project has a number of facets: systematic review, citizens’ juries, adolescent health research advisory groups, guideline development, participatory research, living labs.

**Supervisor:** Prof Kate Steinbeck, The Kids Research Institute, The Children’s Hospital at Westmead Clinical School  
kate.steinbeck@health.nsw.gov.au

---

**Cloning of synovial fibroblast-like homing receptors**

**PhD, Masters, Honours**

The identification of a homing receptor specific for synoviocytes opens new prospects for targeted arthritis therapy. There are a number of homing receptors noted on endothelial cells and inflamed vessels around joints but none specific for Synovial Fibroblast Like cells. If this proves to be a new homing molecule then it would be unique in its specificity and it will advance knowledge in basic science and create new opportunities for clinical applications.

**Supervisor:** Prof Nicholas Manolios, Westmead Hospital  
nicholas.manolios@sydney.edu.au
Use of glyceryl trinitrate in the modulation of inflammatory milieu in preeclampsia (PE) and intrauterine fetal growth restriction (IUGR) – basic and clinical applications

PhD, Masters

This project focuses on translation from laboratory bench to the bedside. Our work will examine a potential role for glyceryl trinitrate (GTN) in PE and IUGR, utilizing both cell culture in the laboratory and a clinical trial in a hospital setting. GTN is safe, simple to use, easily transported, relatively cheap, and could have applications in the treatment of preeclampsia and IUGR.

Supervisor: Dr Indika Alahakoon, Westmead Hospital
indika.alahakoon@health.nsw.gov.au

Mechanoreceptors in joints

PhD, Masters, Honours

This is a very new field examining ion channels in fibroblasts and how they help the cells sense mechanical pressure. Mechanoreceptors will be examined in normal, osteoarthritic and rheumatoid derived fibroblasts to see if there is a difference. This project will be done in collaboration with Prof B Martinac at the Victor Chang medical research institute where the neurophysiology equipment (patch clamping) is located.

Supervisor: Prof Nicholas Manolios, Westmead Hospital
nicholas.manolios@sydney.edu.au

Adolescents, risk-taking and sexual health

PhD, Masters, Honours

Adolescent health compromising behaviour including sexual behaviours are important indicators of adolescent and young adult well-being. As part of data collected in a birth cohort this project will seek to examine the patterns of health compromising behaviour in adolescence and young adulthood and their origins in early life.

Supervisor: Prof Rachel Skinner, The Kids Research Institute, The Children’s Hospital at Westmead Clinical School
rachel.skinner@health.nsw.gov.au

Cellular constituents defining cell stiffness

Honours

There is increasing interest in cell biomechanics. We recently published a novel and highly nuanced method for measuring cell stiffness by scanning atomic force microscopy that generates ‘stiffness fingerprints’. This project is to combine this method with fluorescence labelling of cells, to determine the sub-cellular features that give cellular microdomains their stiffness characteristics.

Supervisor: Prof Hans Zoellner, The Faculty of Dentistry
hans.zoellner@sydney.edu.au

A new anthropometric measurement of health outcomes

Honours

The aim of this research is to demonstrate that people’s self-estimation of weight, BMI and other health parameters are different from objective measurement using M Port machine as a modality of measurement. Ten different medical-surgical specialties and their patients will be invited to participate in this study. The baseline survey will include closed-ended questions and an interview with open-ended questions asking about their perception of the current conventional method of health assessment using weight, height and BMI, as well as their knowledge on the machine and its potential in improving health outcomes of patients. The doctors will then be encouraged to use this machine in conjunction with conventional method to compare the outcomes. Follow up survey and interview will assess the doctors’ and patients’ views on the machine and its ease of use and value in patients’ management.

Supervisor: Dr Seng Chua, Westmead Hospital
drchuasc@gmail.com
Quantifying cell-cell and cell-microenvironment interactions and their effect on dental pulp stem cell growth dynamics

**PhD, Masters, Honours**

A stem cell’s fate and behaviour is controlled by interactions between the extrinsic stimuli it receives and the cell’s internal molecular state. This project will investigate how cellular memory influences cell fate. Cells have memory, which is reflected in concordant fate outcomes for related cells (sisters, cousins, etc.). The project aims to understand how cell-microenvironment and cell-cell interactions influence concordant outcomes. Time-lapse microscopy will be used to create movies of dental pulp stem cell growth dynamics. Growth dynamics of individual cells and their interactions will be recorded using custom-made single-cell tracking software. Tracking data will then be analysed to determine how cell-cell and cell-environment interactions influence concordant fate outcomes in cellular kin.

**Supervisor:** Dr James Cornwell, Faculty of Dentistry

[james.cornwell@sydney.edu.au](mailto:james.cornwell@sydney.edu.au)

---

The anti-apoptotic activity of serum albumin for endothelium

**PhD**

We have discovered that serum albumin inhibits blood vessel endothelial apoptosis, and propose a role in regulating the shape of micro-vessels during normal development and wound healing, as well as in atherosclerosis and hypertensive vasculopathy. This project will identify the albumin protein domain and receptor responsible using yeast expression system to firstly identify the active anti-apoptotic site in albumin, and then use this to identify the relevant G-protein coupled receptor.

**Supervisor:** Prof Hans Zoellner, Westmead Centre for Oral Health

[hans.zoellner@sydney.edu.au](mailto:hans.zoellner@sydney.edu.au)
REAL PEOPLE. REAL SCIENCE.