Understanding What Drives Prostate Cancer

Claire McLaughlin was awarded a Cancer Council Summer Vacation Scholarship for 2012-2013. Her project focused on the ADAM 28 metalloproteinase enzyme which has been shown by Ass. Prof Vance Matthews at the Harry Perkins Institute for Medical Research to be upregulated in prostate cancer in males.

“The scholarship has furthered my interest in research. The techniques of cell culturing, overexpression by transfection, immunocytochemistry, western blotting and quantification have advanced my research skills beyond my bachelor degree,”

Claire spent 2013 working in the same Laboratory to complete her Bachelor of Biomedical Science degree which she was awarded a 1st Class Honours.

During the year Claire gave presentations to the Combined Biological Sciences Meeting and the Student Symposium at the Australian Society for Medical Research Conference which were both held in Perth.

Assistant Professor Matthews agrees…

“Claire has been a great representative for both WAIMR and Notre Dame, as was evident in her recent impressive oral presentation at this year’s Australian Society for Medical Research Student Symposium.”

Sarah McLaughlin discussing her project with supervisors Ass Prof Vance Matthews (WAIMR) and Assoc Prof Gerard Hoyne (UNDA) (above).

Claire busy at work in the lab (right)

Sarah has enrolled in the Master of Philosophy course in 2014 and will complete her research project at the Harry Perkins Medical Research Institute in the laboratory of Ass Prof. Vance Matthews. The project will examine the role of the metalloproteinase enzyme, ADAM19, in prostate cancer.

Claire McLaughlin discussing her recent research at the University of Notre Dame - Australian (UNDA) (top left).
In 2013 there were 5 students that undertook Honours degrees in the School of Health Sciences. The outcomes are shown below.

**Lauren Wheeler** BHPE (Honours H1) "Restricting and Comparing: Examining the relationship with dietary behaviour and body image among adolescent girls." Supervisor A/Prof F. Farringdon

**Sarah Lynch** BHPE (Honours H1) "Does School Canteen Policy Make a Difference? Comparing what high school students eat at school across two sectors." Supervisor A/Prof F. Farringdon

**Claire McLaughlin** B. Biomed.Sc (Honours H1) "Role of ADAM28 in prostate cancer“ Supervisors: Ass Prof V. Matthews, (HPMRI) A/Prof G. Hoyne

**Cameron Carling** B. Biomed Sc (Honours 2A) "Metabolomics and opioid signalling" Supervisors: Dr. I. Mullaley (Murdoch U), Dr G. Maker, (Murdoch U) A/Prof G. Hoyne

**Nicholas Lichtenberg** McGill B. Biomed Sc (Honours 2B) Improvement of HEK293 survival in cells expressing neuroprotective NCX2 peptides, following exposure to calcium cytotoxicity and oxygen-glucose deprivation (OGD). Supervisors Dr B. Meloni (ANRI), Mr R. Anderton

Health Science Students forging ahead with their research

Keyuri Kori was the first Health Science student to enrol and complete the Master of Philosophy degree in the area of Biomedical Science.

Keyuri came to UNDA after completing her undergraduate degree in Biomedical Science at Edith Cowan University and began her studies in February 2012.

Mesothelioma is a non-curable cancer in humans that is induced by exposure to asbestos fibers. The cancer usually takes a long time to develop and therapeutic avenues are not available.

Keyuri was able to demonstrate that TGF-β treatment, a growth factor expressed by cells in the lung, of mesothelial cells leads to activation of intracellular signalling that could induce co-activation of the Shh signalling pathway leading to activation of the Gli2 transcription factor.

The TGF-β and Shh signalling pathways have both been implicated in human cancer pathogenesis and understanding how both pathways are regulated could lead to improved treatment for a life threatening and incurable disease.

The research project was undertaken at the Tissue Repair Group at the Lung Institute of W.A. The project was supervised by Prof Steven Mutsaers, Ass Prof Cecila Prele.

**Grant Success with NH&MRC**

Idiopathic pulmonary fibrosis (IPF) is the most common and aggressive form of interstitial lung disease in humans, occurring predominantly from middle age onwards with 7-10 per 100,000 new cases diagnosed annually. It has been predicted that this number will increase significantly due to better diagnostic approaches and an aging population. IPF is a debilitating and ultimately lethal disease, with a mortality rate worse than that seen with many cancers or heart failure. It has a median survival of only 3 years from diagnosis, and there is currently no known cure.

The cause of IPF is unknown but it is widely accepted that repetitive epithelial injury in the lung followed by aberrant repair, fibroblasts/myofibroblast accumulation and an overproduction and deposition of collagen, are central pathogenic mechanisms.

Scientists led by Prof Steven Mutsaers and Dr Cecila Prele, Prof Geoff Laurent from the Lung Institute of W.A, Prof Darryl Knight University of Newcastle and A/Prof Gerard Hoyne UNDA were awarded a prestigious NH&MRC project grant to investigate how signalling through the STAT3 transcription factor in epithelial cells leads to the recruitment of antibody producing B cells to sites of tissue damage and how they contribute to disease pathogenesis. The study will run from 2014-2016.
Recent Publications


Post Graduate Students in Health Sciences

Ashley Cripps  
Doctor of Philosophy (Exercise and Sports Science)  
An examination of the AFL talent development pathway, testing validity and the associated selection outcomes.  
Supervisor Dr L. Hopper

Tegan Grace  
Doctor of Philosophy Institute for Health Research  
“Determinants of motor coordination in children and adolescents: A longitudinal study”

Erin Fee  
Master of Philosophy  
“Metabolite Profiling of Human Milk in Mothers With Nipple Pain”

Honours students 2014

Karolina Goresevski  
Bacheelor of Biomedical Science Honours  
“The role of microRNA 193b in erythropoiesis”.

James Nelson  
Bachelor of Biomedical Science Honours  
“Impact of lifestyle factors on progression of Alzheimer’s disease”

Adam Edwards  
Bachelor of Biomedical Science Honours  
“Investigation of the neuroprotective mechanism of polyarginine peptides.”

Carmen Papaluca  
Bachelor of Health and Physical Education (Secondary) (Honours)  
“Pictures of #me: Does Instagram and Facebook use influence emotional states in university-aged females?”

3rd year students interested should speak to their Course Supervisor for advice.

Ashley Cripps PhD student

Thesis Title:  
An examination of the AFL talent development pathway, testing validity and the associated selection outcomes.

The research project will examine the AFL talent development pathway by assessing how various factors impact on elite youth selection outcomes in Australian Football. Specific factors to be assessed include age and maturation, physiological and psychomotor testing and subjective coach assessment. The efficiency of the talent pathway will also be examined.

The study will provide coaches and talent identification officers with important information about what factors should and should not be considered when selecting athletes for long-term development.

Ashley completed his B. Ex Sports Sc (Hons 2A) in 2012 and commenced his PhD in 2013.
Searching for a better outcome from Stroke

Ryan Anderton is a lecturer in the School of Health Sciences and coordinates units in Human Structure and Function, Genetics and Neuroscience. He is currently completing his PhD at UWA.

My primary areas of research are molecular neurobiology, neurodegeneration, and the development of neuroprotective therapies.

I have devoted the majority of my research into a common neurodegenerative disease called spinal muscular atrophy (SMA). This mono-genetic disorder is characterised by motor neuron death and muscle paralysis in patients. My findings in SMA have cemented a crucial role for the survival of motor neuron (SMN) protein in regulating apoptosis and the promotion and activation of numerous survival signalling pathways. In addition, my research has involved extensive in vitro disease modelling and the establishment of a novel apoptotic assay. Finally, while investigating neurodegeneration, I have designed and developed multiple adenoviral and cell-penetrating peptide neuroprotective strategies that are currently under investigation.

Recent Awards:
Australian Neuromuscular Research Institute “PhD student of the year” (2011)
Combined Biological Science Meeting “Manuscript Award” (2012).

Recent Publications:
Anderton

How Exercise impacts Immune Function

How does exercise impact health and immunity? This has been a long standing question and there is increasing interest in understanding the link between exercise and its impact on immune function.

There is anecdotal evidence that elite athletes become susceptible to infections after bouts of high intensity training. However, little is known about the mechanism responsible for the susceptibility.

In a collaborative study between scientists at UNDA School of Health Sciences and Exercise Sports Science at Murdoch University the effect of exercise performed under normal or hypoxic conditions examined the distribution of white cell blood populations pre-, post and 60mins following a 45min cycle session.

The main finding was that the lymphocytes were readily mobilized into the blood during exercise and during the recovery period the cells the cells were lost from the blood and fell to levels below what was detected at baseline.

Future studies will investigate how exercise impacts the function of the lymphocyte populations following exercise and how changes in innate immune function impact on susceptibility to infection.

The study was funded by the Research Incentive Scheme at UNDA (GH)

We Need you!

We would like to hear your research story.

Send us a brief 125-150 word summary of your research project and we will include it in the next issue of the Research Newsletter!
School of Health Science Research Seminars for Semester 1 2014.
The School of Health Sciences holds a seminar series each semester that examines contemporary topics in Health Science research encompassing Exercise and Sports Science, Biomedical Science and Preventive Health. Speakers include Health Science staff members and external speakers from other Universities and Research Institutes around Perth. This is a great way to learn about the latest developments in scientific research.

Time: Friday 4-5pm
Venue: ND46-302 School of Health Sciences Seminar series Semester 1 2014
The Seminar series begins:
March 7th Gerard Hoyne UNDA
“Understanding the mechanism of lung fibrosis and diabetes”.

Professional Societies for postgraduate students

Most professional societies have great opportunities for undergraduate and postgraduate students to join and receive a range of benefits. Below are a list of societies related to the School of Health Sciences.

Exercise and Sports Science Australia (ESSA) is a professional organisation which is committed to establishing, promoting and defending the career paths of tertiary trained exercise and sports science practitioners.
(www.essa.org.au)

The Australian Council for Health, Physical Education and Recreation Inc. (ACHPER) is the peak professional, association representing professionals working in the fields of Health, Physical Education, Sport, Movement Sciences, Dance and Community Fitness.
http://www.achperwa.asn.au/

Outdoors WA is the peak body for the outdoor sector in Western Australia, including camping, outdoor recreation and outdoor education.
http://www.outdoorswa.org

Australasian Society of Immunology (ASI)
The aim of the Society is to encourage and support the discipline of immunology in the Australasian region.

Australian Society for Biochemistry and Molecular Biology.
The Society aims to advance Biochemistry and Molecular Biology in Australia, facilitating research and education, and interfacing with business and the community.
http://www.asbmb.org.au

Australian Society of Microbiology is the peak society to maintain suitable standards for the practice of microbiology as a profession.
http://www.theasm.org.au

Australian Society for Medical Research (ASMR) is the peak professional body representing Australian health and medical research.
http://www.asmr.org.au/