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[AuPS Website](#)

Member profile - Dr Bianca Bernardo Baker IDI Heart and Diabetes Institute



What is your research background?

I obtained my PhD from The University of Melbourne and Murdoch Childrens Research Institute, where I studied key genetic and biological mechanisms of skeletal development and disease, under the supervision of Professor John Bateman. While I was writing my thesis, I moved away from academia to industry, and worked for Leica Microsystems developing an automated DNA *in situ* hybridisation diagnostic test for breast cancer. As my thesis was nearing completion, I was keen to move back into academia (having missed the freedom a research environment offers you) and was fortunate to land a postdoctoral position with

A/Prof Julie McMullen. I now study physiological cardiac hypertrophy, focussing on targeting novel components of the phosphoinositide 3-kinase (PI3K) pathway as a therapeutic strategy to treat heart failure. Specifically, I am interested in examining the therapeutic potential of PI3K-regulated microRNAs in settings of heart disease.

What was your award winning publication?

My publication was titled *Therapeutic inhibition of the miR-34 family attenuates pathological cardiac remodeling and improves heart function* and was published in the Proceedings of the National Academy of Sciences USA in October 2012 [[PNAS 2012, 109\(43\): 17615-20](#)]. MicroRNA-34 (miR-34) family members are upregulated in the heart in response to stress. My study investigated the effects of miR-34 inhibition using a subcutaneously delivered tiny locked nucleic acid-modified antimiR targeting the entire miR-34 family (tiny LNA-antimiR-34; a microRNA inhibitor) in mouse models of heart disease (hypertension and heart attack). Treatment with the miR-34 inhibitor attenuated adverse cardiac remodelling and improved cardiac function. My study also demonstrated that there was no evidence of toxicity with LNA-antimiR-34 treatment. This is important as current heart failure treatments

often have a number of side effects. LNA-antimiRs have already clinical trials for the treatment of Hepatitis C and high cholesterol, thus this study has therapeutic potential and can be highly translatable.

What do you do to relax?

You will often spot me in lycra cycling down Beach Road or up a mountain on weekends. However, trying to keep up with the bunch, or climb steep gradients or attempting to claim a “Queen of the Mountain” on Strava can be a challenge (similar to publishing manuscripts), but rewarding! The social coffee, chit chat with friends and my vegemite on toast afterwards is relaxing, as is stopping to take photos for Instagram of my cycling adventures. Other places that I can be spotted include cafés, having a coffee on Bay Street (Port Melbourne) and at Etihad Stadium or the MCG to watch Essendon AFL games. Although the latter was not a relaxing experience last year!

What is the research direction you would like to take in the next 3-5 years?

To develop cardiac-specific microRNA based therapies for the treatment of heart failure, acquire my own fellowships/grant support to carry out this research.

Bianca was jointly awarded the SDR publication presentation prize at the AuPS 2013 Scientific Meeting in Geelong. The prize is for best original paper published by an AuPS member during their first 4 postdoctoral years.

Member Profile - Dr Wendy Imlach The University of Sydney



What is your research background – how did you get interested in Physiology?

My first taste of physiology was in my second year at Otago, and although it wasn't my major, it was definitely a favourite! Further down the track, after working as a microbiology technician for a few years, I really felt like a change in research area and I decided to go back to school and study neurophysiology. After a bit of searching, I was lucky to find a PhD project studying BK channel physiology and pharmacology. From here I went to NYC to do a postdoc at Columbia University researching sensory-motor circuitry. I am currently a postdoc in the laboratory of Prof. Mac Christie, University of Sydney, where I am working on pharmacological treatments for neural hyper-excitation in chronic pain. Over the past year I have been investigating allosteric enhancers of adenosine modulation in the dorsal horn in chronic pain, and more recently, inhibitory neurotransmission in pain states.

What was your award winning publication?

My award winning publication is: Imlach et al. (2012) *SMN is required for sensory-motor circuit function in Drosophila* [Cell 151\(2\):427-39](#). This research focussed on the motor neuron disease Spinal Muscular Atrophy (SMA), which is a common, progressive and ultimately lethal disease caused by reduction in the levels of SMN protein. It was previously thought that SMN loss in motor neurons caused this disease, but we found that the motor neuron degeneration was due to reduced SMN in cholinergic sensory neurons and interneurons. This resulted in a shift in how we think about the disease and established dysfunction in sensory-motor circuitry as the origin of the motor deficits in SMA. In this paper we also identified a drug that decreases the disease phenotype which is now in clinical trials at Columbia University. This work has also started to change the way clinicians diagnose early SMA, so the sensory aspect of the disease is incorporated into the diagnosis.

What do you do to relax?

I like drinking wine, catching up with friends, and making music every now and then.

What is the research direction you would like to take in the next 3-5 years?

Over the next few years I plan to continue researching chronic pain. At the moment I'm quite excited about inhibitory neurotransmission in the spinal cord, so I am looking forward doing more work in this area.

Wendy was jointly awarded the SDR publication presentation prize at the AuPS 2013 Scientific Meeting in Geelong. The prize is for best original paper published by an AuPS member during their first 4 postdoctoral years.

**INTERNATIONAL UNION OF PHYSIOLOGICAL
SCIENCES**

Physiology without borders...



Check out the new IUPS website: <http://iups.org/>

2014 Australian Physiological Society Meeting
30 November to 3 December, 2014.
The University of Queensland, Brisbane



Local contact: Dr Bradley Launikonis, b.launikonis@uq.edu.au

AuPS Invited Plenary Lecturer: Prof Jamie Vandenberg
Victor Chang Cardiac Research Institute

Invited Plenary Speakers:

Prof Robert Parton, The University of Queensland, *Plasma membrane and caveolae.*

Prof Don Bers, UC Davis, *Calmodulin and CAMKII signalling in the heart.*

Research Symposia (with over 9 international speakers!)

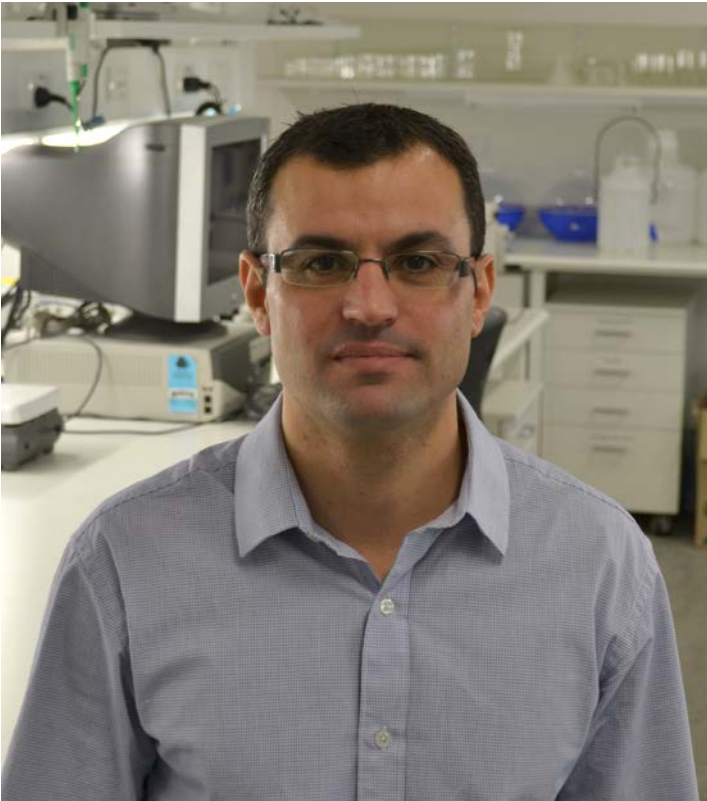
- Cardiomyocyte Ca²⁺ and Na⁺ signalling – new mechanistic insights
- Interaction of metabolic balance and growth hormone
- Cardiac metabolic stressors and sensors
- Early life environment as an indicator of health; outcomes and prevention
- Frontiers of molecular mechanisms of ligand recognition and activation of receptor channels
- Ion channels and pathophysiological changes in ionic regulation
- New insights into exercise and insulin sensitivity
- Placental development and function: effects of maternal perturbations during pregnancy
- Can we age well?
- Mechanisms and treatments for muscle wasting
- Genetics influences on skeletal muscle physiology and athletic performance
- Exocytosis

Physiology Education Symposium

- Teaching and learning within undergraduate research experiences in physiology

***Conference Dinner:* Customs House, Riverside**

Member Profile - Dr Nir Eynon Victoria University



What is your research background - how did you get interested in Physiology?

My career path started by undertaking an undergraduate and Master degrees in Exercise Physiology at the Zinman College of Physical Education and Sports Sciences, Israel. This led to a PhD study that focused on the effect of genes on athletic performance. After I completed my PhD, in late 2010 I commenced a 10-month Fellowship at the Ariel University Centre, Israel, investigating the effect of ACTN3 gene on human athletic performance. In September 2011, I relocated to Melbourne with my family and was appointed as a Research Fellow in the 'Training and skeletal muscle function' research group, led by Professor David Bishop, in the Institute of Sport, Exercise and Active Living (ISEAL), Victoria University. In June 2012, I was appointed

as a full-time Lecturer in Exercise Physiology, College of Sport and Exercise Science, Victoria University. In 2013, I was awarded an ARC Early Career Fellowship (DECRA).

What are you working on now?

Professor David Bishop, Dr Sean Yan and I are planning a large-scale study at Victoria University on the influence of genes on muscle metabolism and adaptation to exercise training. The main question that we constantly ask ourselves is why people are so variable in their response to similar exercise training and how much does the ACTN3 gene contribute to the training variability?

During 2012, I initiated active research collaboration with Professor Kathryn North from the Murdoch Childrens Research Institute, to investigate the consequence of ACTN3 genotype on human muscle metabolism and performance. Prof North has identified a common null polymorphism (R577X) in the ACTN3 gene that results in the absence of α -actinin-3 in more than one billion humans worldwide. Subsequently, Prof North's group has developed an Actn3 knockout (KO) mouse model and demonstrated that α -actinin-3 deficiency (ACTN3 XX genotype) is associated with reduced strength/power and enhanced endurance capacity due to the "slowing" of the metabolic and physiological properties of fast muscle fibres. The human ACTN3 gene encodes α -actinin-3 protein, a major structural component of the contractile apparatus in fast skeletal muscle fibres, which interacts with multiple structural, metabolic and signalling proteins. Prof North's research in Actn3 KO mice indicates that **ACTN3 is an important mediator of cell signalling, and may influence the magnitude of adaptations to endurance training.**

Our current project is an extension of this work, and aims to discover the molecular mechanisms underlying the effects of α -actinin-3 deficiency on the adaptive response to

exercise training in humans. It is hoped that this study will assist to explain why you can have two people at the same base fitness, eating the same foods and doing the same workout three times a week, however one increases their oxygen capacity within the muscle by 30% while the other increases their oxygen capacity by only 5%. We are now looking for 18 to 40 year old men to participate in a pilot training program to see how they respond, based on their ACTN3 gene variant.

How has the Society helped with your career so far?

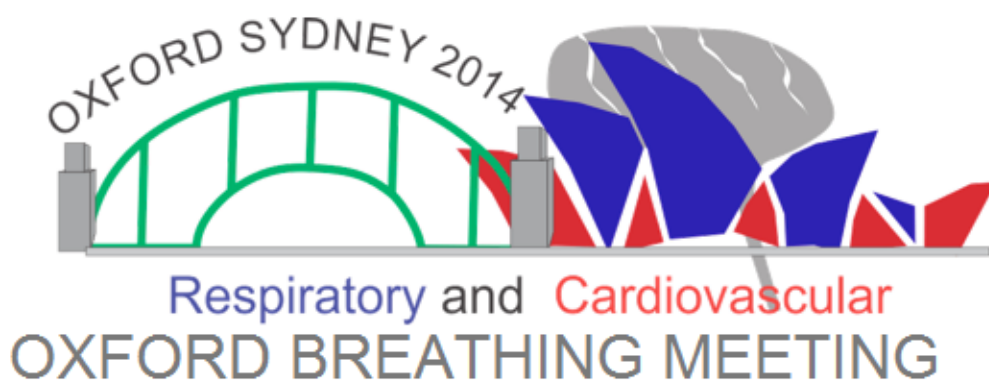
My first AuPS annual meeting was in Sydney, 2012, where I presented my work on the ACTN3 gene and performance. During this conference, I was fortunate to meet some key people that have provided constructive advice on my career pathway. In the forthcoming AuPS meeting in Brisbane I will participate in a symposium titled "Genetics influences on skeletal muscle physiology and athletic performance". The speakers in this symposium (leaders in the field; including Prof Yannis Pitsiladis, chair of Sport and Exercise Science at the University of Brighton, UK) will summarise the most recent developments in the field.

What is the research direction you would like to take in the next 3-5 years?

I feel very fortunate to be working as a University Researcher. I greatly enjoy the research project I am involved in. The study of genes and performance is in its infancy and I anticipate that in the next 3-5 years we will have a better understanding of the genes and the molecular mechanism that influence performance.

What do you do to relax?

I have two young boys, 8 and 5 years old, so the majority of my time is dedicated to hanging out with my wife and my boys. My oldest boy and I enjoy watching soccer and AFL games, and we all enjoy visiting Australian towns and places of interests. We all think Australia is a beautiful country.



DATE: Sunday 26 - Friday 31 October 2014. Conference opens on Sunday 26 October 1500-1800

The key international meeting on central cardiorespiratory control.

More details at [OXFORD BREATHING MEETING](#) or contact Paul Pilowsky: paul.pilowsky@hri.org.au



Call for Papers: Special issue of *International Journal of Innovation in Science and Mathematics Education* (IJ-ISME) on:

Science Communication in the Undergraduate Curriculum

Guest Editors: Dr Susan Rowland, Dr Kay Colthorpe and Stephanie Beames
Special issue of IJISME on Science communication

The International Journal of Innovation in Science and Mathematics Education (IJ-ISME) is pleased to announce a special issue for 2014 on Science Communication. This opportunity will enable authors to contribute to the wider discourse around communication skills in undergraduate science and mathematics education. We are calling for papers that provide evidence-based examples of activities that build communication skills and which can be built upon by academics across the science disciplines.

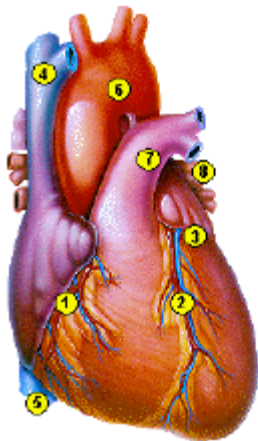
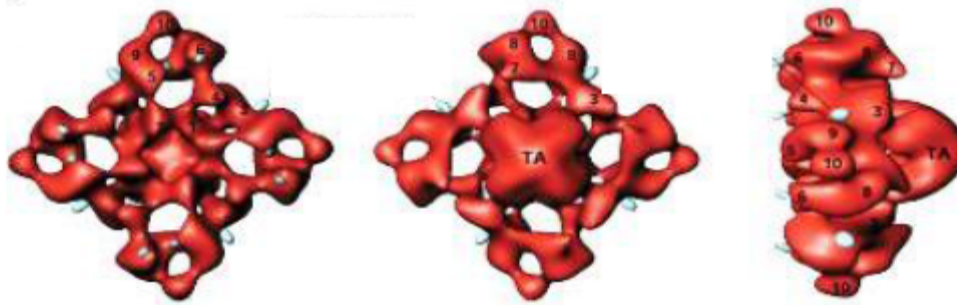
Papers should be between 3000-6000 words in length. Guidelines for authors are available at: escholarship.usyd.edu.au/journals/index.php/CAL/about/submissions#authorGuidelines

Abstracts are due 14 March 2014. Interested authors should initially submit a 250-word abstract for consideration to s.rowland1@uq.edu.au.

This expression of interest is to help ensure that the final edition addresses a broad range of disciplines and challenges.

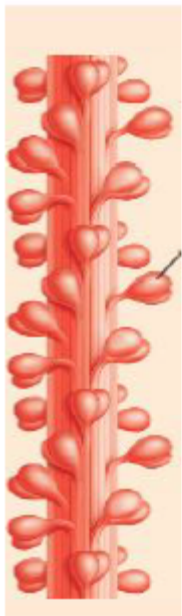
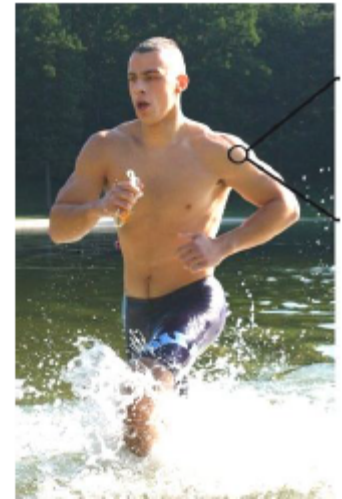
Manuscripts due: 28 April 2014, with final versions due 30 June 2014

This special issue will be published online in October 2014 in conjunction with the 20th Australian conference on Science and Mathematics Education (ACSME) <http://sydney.edu.au/iisme/conference/2014/index.shtml>



The Gage Conference on Muscle

Canberra Boys Grammar School,
ACT, April 14th to 16th 2014



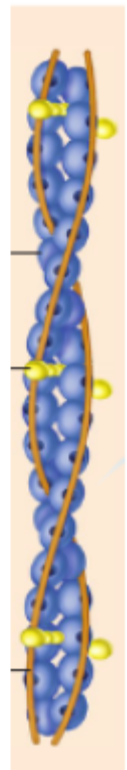
This is a biennial meeting continuing the original series of Curtin Conferences organized by Peter Gage. It encompasses all aspect of the biology of striated muscle, including excitation-contraction coupling; ryanodine receptor physiology and biophysics; Ca^{2+} regulation; performance and fatigue; metabolism and aging; cardiac muscle growth and dysfunction; myopathies.

Abstract submission will start early 2014

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Further information: <http://www.gageconf.org.au>
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This issue of AuPS News was compiled by Glenn Wadley and with many thanks to the generous contributors.

The next issue of AuPS News will be distributed to members in June 2014.
All contributions for AuPS News should be sent to: newsletter@aps.org.au before the end of May.