

June 2014

Michael Roberts Education Award Winner 2013 Dr Kay Colthorpe



After completing my undergraduate degree in South Australia and working in industry for some years, I returned to university as a research student at the University of Queensland in the 1990's. My interest in physiology was very much focussed on endocrinology, with my PhD being on the dopaminergic control of prolactin secretion, undertaken in the lab of Jon Curlewis. While I really enjoyed my area of research (and still love endocrinology), I found that one of the most rewarding aspects of my PhD was the teaching I did during it, and I became very interested in how students actually learn physiology, particularly given the conceptual nature of our science. At that

time I also developed my enthusiasm for teaching in laboratory classes, and I remain passionate about the value of laboratory classes in developing students understanding of physiology.

After being awarded my PhD in 2000, I became an academic in the School of Biomedical Sciences at UQ, and began teaching in earnest, across Science, Medicine and the Allied Health programs. It was fortuitous timing for me, as at the time there were the beginnings of a groundswell around research into teaching in the disciplines, which was embraced with enthusiasm by SBMS. I became involved in education research, initially through doing a Grad Cert in Higher Education. My early research focussed on the benefits of 'active learning' for physiology students, through increased interactivity in lectures but also particularly in laboratory classes, and I began developing classes that incorporated greater opportunities for students to engage in inquiry. These were the forerunners of our current vertically-integrated, inquiry-based classes, which have had such an impact on student learning and engagement, and have been nationally recognised for their quality. During those early years in teaching I also became interested in assessment design, almost accidentally, after a minor change in the assessment of one of those early inquiry-based practical classes had a huge impact on student engagement within the class, and a subsequent jump in student performance. This demonstrated to me just how much assessment could drive the learning process.

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Currently, there are many challenges facing physiology education, and science education more generally. The creation of the Science Threshold Learning Outcomes (TLOs), and the tailoring of those to Biomedical Science, fostered through CUBenet under the leadership of Phil Porronik and Yvonne Hodgson and others, has meant that considerations of student understanding of physiology have been central to that process. The challenge now is to develop methods to embed the TLOs into our courses and programs, to increase opportunities for students to meet the breadth of those TLOs and to provide evidence of their achievement. This has been aided by the production of the TLO Good Practice Guides (<http://www.olt.gov.au/resource-library?text=TLO+good+practice+guides>), which contain many exemplars from biomedical science. Another significant challenge we face is the rise in student enrolments in our courses. While it is great that it means more students are studying physiology, the increasing costs, particularly associated with laboratory class teaching, has the potential to negatively impact on the quality of the student experience of those classes. Given how central experimentation is to physiology, and the multiple skills students can gain in laboratory classes, we must strive to maintain (and continue to improve) the quality of our laboratory class design and teaching.

While we face these and many other challenges, there are also interesting developments occurring in Physiology Education that will provide us with the means to cope with them. There are increasingly rich resources available to us online, to aid in class and assessment design, to use as student learning resources and to inspire our teaching. However, the extent of those resources has in itself become challenging, as trying to find and access good resources is a time-consuming task. In response, my colleague Kirsten Zimbardi and I have become involved in a project, supported by the Australian Council of Deans of Science, to develop the 'SMART directory', an annotated, searchable and peer-reviewed directory of T&L resources for science and maths academics, which will be launched in the next few months and we hope will make good quality resources much more accessible. Another interesting new development that is beginning to impact on education is the use of 'learning analytics', which allows analysis of patterns of student interactions with online resources. This new field is rapidly developing, currently much of the focus has been on broad patterns of engagement at the institutional level, but more individualised information is starting to become available. This individualised information allows academics and educational designers to track patterns of student interactions with specific learning resources, assessment items and feedback, which can in turn inform the development and provision of more effective educational materials.

My research has also continued to evolve, while I have been interested for some time in the development of 'scientific skills' in students studying physiology, one of my current interests is in how students develop scientific arguments in oral presentations. My collaborators and I have developed methodologies to measure the quality of scientific argument in oral presentations, allowing us to identify key problem areas in students' scientific arguments, and to modify assessment designs to address those key problems. We have also been pursuing research on feedback for some time, using a multi-faceted view on the way feedback is provided, its value and students' responses to it. This work has identified the type and nature of effective feedback, and has encompassed the extensive use of feedback analytics to identify patterns of effective feedback provision and use. In addition, I have been examining the value of feedback to and from peers, and its contribution to the development of students' abilities to critique their work (which I presented at AuPS in 2013). Finally, my newest area of research is on 'meta-learning' assessment tasks. These tasks have multiple functions; they encourage students to regularly review and explain their understanding of physiological concepts, but also encourage them to consider the strategies they use to learn, and to set goals for their learning. In addition, the tasks are useful for us as they enable us to identify firstly, the concepts students struggle with and secondly, the self-regulatory behaviour of

students and the relationships between their self-regulatory strategies, learning outcomes and academic resilience. Currently, we are designing meta-learning tasks as interventions, to prompt students to undertake more advanced forms of self-regulation, and evaluating the impact of that on academic performance.

It was a great honour last year to win the Michael Roberts Award, I greatly appreciate the support and recognition from the AuPS and the opportunity to present my research at the next meeting, in Brisbane later this year. As a physiologist, my research is somewhat unusual, so I recognise how fortunate I have been to have had great support from my collaborators and students, from my school, SBMS, and from UQ, to enable me to pursue my research interests.

Kay was awarded The Michael Roberts Excellence in Physiology Education prize at the AuPS 2013 Scientific Meeting. Kay will present the Roberts Award Lecture at the 2014 AuPS meeting "From active learning to self-regulated learning". Nominations for the 2014 Roberts award will be opening soon, and will close in October. Please keep an eye on the AuPS website for more details.

Student member profile - Tahnee Kennedy The University of Melbourne



What is your research background?

I was always interested in working in the medical field so like most other students sharing this interest, I undertook a degree in Biomedical Science. I completed my degree at La Trobe University and then took a year away from study to travel. I returned to La Trobe to complete my Honours degree in the School of Human Biosciences, where my research project focused on developing therapeutic interventions for Duchenne muscular dystrophy.

What are your current research interests?

During my undergraduate studies, I was never really interested in research and my main reason for undertaking Honours was to assist in applications for other courses. It wasn't until about half way through my honours year that I decided research was something I might want to pursue as a career. It's hard to believe that a few years later, I'm in the third year of my PhD. At the end of Honours, I transferred from La Trobe to The

University of Melbourne where I am continuing to investigate novel therapies for muscular dystrophy, under the supervision of Prof Gordon Lynch, Dr Kate Murphy, Dr Kristy Swiderski and Dr René Koopman.

What are you most looking forward to as a student representative?

I was interested in being student representative of the AuPS to get to know other students in the society and to hopefully be able to initiate some more student involvement. I believe that getting to know each other early in our research careers can really help in collaboration and the provision of constructive feedback down the road. Nicole and I have been working towards these general aims since we were both appointed at the end of last year, and we would really appreciate any input from other students in the society.

Student member profile – Nicole Vargus Charles Sturt University



What is your research background?

Prior to moving to Australia, I completed my Bachelor of Science Degree in Exercise Science at the University of New Mexico in my hometown, Albuquerque, where I also commenced my Master's Degree. At that time, I worked on research involving measuring changes in creatine phosphate and inorganic phosphate during high intensity forearm exercise using P^{31} magnetic resonance imaging. The opportunity came up to move to Australia half way through my Master's Degree, so, I jumped the 'big pond' to Charles Sturt University in Bathurst. Here, I completed my Honours Degree in determining optimal loading for a maximal intensity sprint exercise test on a cycle ergometer. I then began the PhD program, supervised by Frank Marino at CSU.

What are your current research interests?

My PhD work is aligned with the field of fatigue research and exercise performance, specifically looking at changes in the cytokine IL-6 and its receptors during prolonged, fatiguing exercise in thermoneutral and heated environments, along with changes in EEG patterns, cerebral oxygenation, and associated performance measures.

What do you do to relax?

I am a big fan of sport, especially AFL. So, when I have a free weekend, I love getting out to the local games (of any sport, really!), or I'll go and watch the Giants or Swans play in Sydney. I enjoy being active and outside, but also reading a good book or watching a movie. Really, anything that switches my mind off from PhD is good!

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

I hope that the next 3-5 years will bring some exciting opportunities! I would like to invest more time in fatigue research, possibly in diseased populations with neurological conditions. I'm very interested in any neurological based research in general, so hopefully using EEG in my present studies will open up some doors to continue with EEG/MRI/TMS research in the future.

What are you most looking forward to as a student representative?

I am looking forward to being a student representative because I think there are a lot of avenues that can be pursued to help students become more involved in the society. I hope that over the next couple of years, I can help to facilitate student involvement through some changes, so stay tuned!!

AuPS student members can send Tahnee and Nicole their suggestions for the Society using their email addresses on page 1 of this newsletter.

Mid-year update from AuPS National Secretary

Firstly, I would personally like to thank the outgoing AuPS National Secretary, Robyn Murphy, whose diligent and efficient management of AuPS matters has contributed significantly to the smooth running of the Society. I'd also like to thank the outgoing President, David Allen, for his balanced and considered decision making and representation of the Society at several national and international forums. David will continue to serve as the AuPS Editor. The 2013 AGM saw the induction of Graham Lamb (Latrobe University) as President and myself as National Secretary. I would also like to welcome our two new student representatives on Council; Tahnee Kennedy (University of Melbourne) and Nicole Vargus (Charles Sturt University). They have hit the ground running and I'm sure they will provide an active voice for student members.

There have been a few changes in the structuring of the AuPS Council with respect to demarcation of duties. After many years of extraordinary service, Dave Davey has relinquished several important roles including that of IT Manager. Andrew Hoy (The University of Sydney) has taken over this important role and under the guidance of Dave will continue to develop the IT platforms for AuPS. Dave will continue to serve on Council and fulfils the role of Production Editor. Annick Anselin has stepped down as Webmaster and this role has been filled by Glenn Wadley (Deakin University). Finally, many thanks to the active members of Council who are committed to the running of the Society.

Graham Lamb attended the 'Science Meets Parliament' event on March 17th-18th as the AuPS representative. This event is organised by Science and Technology Australia and is an important opportunity for scientists to meet with parliamentarians to try to establish a good working relationship between the scientific community and parliamentarians, and hopefully to help instil a good understanding of the contribution and importance of scientific research. The first day involved an informative program for the scientists on the processes of government and how issues are brought to the government's attention and considered, with talks by representatives of government departments, political journalists and lobbyists. On the second day there were presentations by the CEO of the Australian Research Council and the Chief Scientist, and more than eighty face to face meetings between individual parliamentarians and groups of two or three scientists. Graham had very cordial half hour meetings with both Catherine King (the Shadow Minister for Health, and member for Ballarat) and Warren Snowden (member for Northern Territory), with discussions ranging over a number of topics including what physiologists do and the importance of supporting both basic as well as applied research.

This years annual scientific meeting will be held at The University of Queensland, Brisbane, from Sunday 30th November to Wednesday 3rd December. Brad Launikonis and the AuPS local organizing committee have put together a terrific program that includes nine International speakers and provides representation across most of the major interest groups of the Society. The plenary speakers are world leaders in their disciplines and include Prof. Jamie Vandenberg, Prof. Rob Parton and Prof. Don Bers. The final details of the program are being finalized but I can say that the conference dinner, which is included in the cost of registration, will be held at the stately Customs House, Riverside. In keeping with the format of previous years, we will once again take the opportunity to present a number of our annual prizes during the dinner. These include presentation of the Michael Roberts Teaching Award, AK McIntyre Award, the Post-Doctoral and PhD publication prizes. The call for applicants for these prizes will be made in August and September. Further details of the meeting are on the website and also detailed in this Newsletter.

We are forward planning for the 2015 AuPS meeting, which will be held in Hobart. The local organising committee is headed by Prof. Steve Rattigan (Menzies Research Institute) and they have already booked MONA for the conference dinner! We are hoping to make this a joint meeting and are in discussions for a future date. The call for symposia for Hobart 2015 will be made in August this year, with submissions likely to be closed around the end of October.

Good luck with the grant rebuttals and I look forward to seeing as many of you as possible at Brisbane 2014.

Matthew Watt
AuPS National Secretary

INTERNATIONAL UNION OF PHYSIOLOGICAL SCIENCES

Physiology without borders...



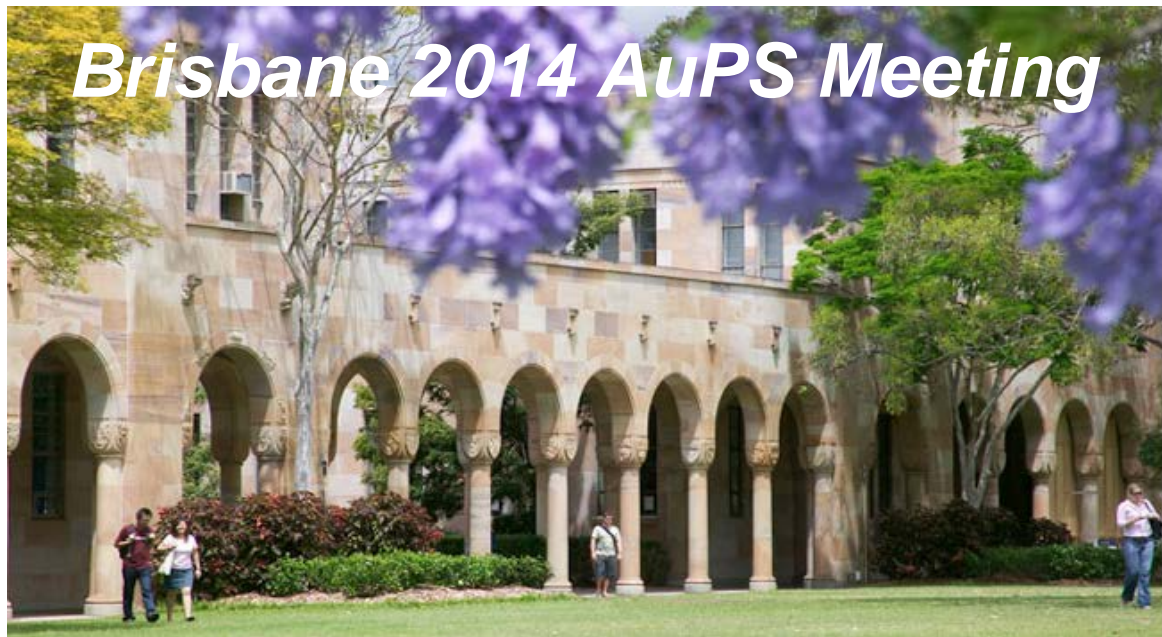
Check out the new IUPS website: <http://iups.org/>



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



The University of Queensland, 30 November to 3 December

AuPS Invited Plenary Lecturer: Prof Jamie Vandenberg

Victor Chang Cardiac Research Institute, *Getting to the heart of ectopic beats*

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.*

Michael Roberts Education Award Lecture (winner 2013)

Dr Kay Colthorpe, The University of Queensland, *From active learning to self-regulated learning.*

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

Student and Early Career mixer for fun, networking and more

For the latest meeting info go to: <http://aups.org.au/Meetings/201411/>

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

Abstract/registration commences: 1st September 2014

Deadline/end of early-bird registration: 26th September 2014

AuPS Supporters



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 September 2014. All contributions for AuPS News should be sent to: newsletter@auaps.org.au before the end of August.