Australian Physiological Society

THE PROFESSIONAL ASSOCIATION FOR AUSTRALIAN PHYSIOLOGISTS

AuPS News – June 2018

The Michael Roberts Excellence in Physiology Education Award 2017:

Associate Professor Glenn Wadley, Deakin University

Can you tell us about your background in physiology education and research?

I'd always loved sport and was fascinated by anatomy and human movement when studying physical education in year 12. This led to me enrolling in a Physical Education (Secondary) degree at what was then Victoria College (Rusden campus), which halfway through my degree merged with and became Deakin University. The course was a relic of the old teacher training colleges, so it was terrific for my training in education, but equipped us poorly for research. It was physiology that I was most interested in during my degree and I was fortunate at the time that by being swallowed up into Deakin a research training pathway started to open up.

By the end of undergrad I had realised that whilst I enjoyed teaching, secondary school teaching wasn't for me. I decided to follow a research pathway that focused on exercise physiology. It was the second year that Deakin had offered an Honours degree in our School and I completed a project investigating the energy systems that Australian Football players utilise during repeated sprinting. I came up with my own research question and developed the project in consultation with my supervisor Dr Peter Le Rossignol. This was quite generous of Peter, but isn't something in hindsight I would recommend as a lot of time was initially spent on project development. Nevertheless I got through and eventually completed a PhD at Deakin University under the supervision of Dr David Cameron-Smith and Prof Mark Hargreaves. The project investigated the impact of endurance training on insulin-signalling in skeletal muscle and was quite a departure from my Honours training. I learned so much not just about physiology but cell signalling and molecular

biology – things that were completely alien to my undergraduate training. This was in the early 2000's and we were at the forefront of discovering that adaptations to exercise training didn't just involve things somehow bumping around in the muscle to mysteriously produce a certain phenotype - like increased mitochondrial content following endurance training. They were the result of a complex and co-ordinated process.

During this time I did the usual casual work as a demonstrator and tutor. However, towards the end of my PhD I was also fortunate to get some valuable experience lecturing exercise physiology on a casual basis to physiotherapy students at The University of Melbourne. I ended up doing this for about 10 years in conjunction with other appointments. As I was finishing my PhD in 2003 I also started working as a research assistant with Dr Glenn McConell at The University of Melbourne in the Department of Physiology. Once my PhD was completed my appointment was upgraded to postdoc and I was in Glenn's lab until early 2009. It was here that I really learnt about physiology – beyond skeletal muscle and started to branch out into other research areas such as the developmental origins of health and disease (DOHaD). We did some great work in Glenn's lab, both human exercise studies and also animal physiology and it was where I really learnt how to write a grant. This was a great time in my life as I was doing full-time research and also starting a family. I kept doing some casual lecturing and in 2009 got a teaching and research position at Deakin University. I don't think I ever planned to become an academic, but I think I'm pretty fortunate to be employed doing the two things I really enjoy.

Can you describe your achievements and teaching innovations for which you received the award.

Based on my experience I've become very accustomed to lecturing to a group of students and have enjoyed being the "sage on stage". However, it's a very passive way to learn and frankly it's not a very effective way to learn. With the advent of recorded lectures, student attendance and engagement has dropped dramatically. So several years ago I began looking for more effective ways to teach and for students to learn.

The award was based on the development and implementation of a suite of active-learning approaches including Team Based Learning (TBL), peer review and individualised video-based feedback to enhance deeper learning in students by improving critical thinking skills and application of knowledge. Importantly, it wasn't enough to just implement them but also provide evidence that they worked and had impact over a sustained period. To provide evidence that they worked we used data analytics, peer review comments, my own student evaluation research, unsolicited feedback from graduates on the annual Graduate Destinations Survey and also student evaluations to establish improved student critical thinking, engagement, teamwork and learner self-management. I've also presented these approaches at a few of the AuPS meetings. This hasn't just been useful for letting my peers know what I've been doing but it's also been incredibly useful to my career for academic promotions etc. So I'd encourage all academic AuPS members to consider sharing their work at our scientific meetings. The first time I presented my work at an AuPS meeting was in 2012 and I was put into the exercise physiology free communications session and I was the only speaker in the session with an education talk. So I was pretty concerned the topic might not be that interesting to the audience. However, the level of interest was overwhelming, with the Chair of the session extending questions into morning tea. It was not something I'd ever encountered before. If only there was that level of interest in the scientific research I have presented! It's terrific that the last few AuPS meetings we now have a full and engaging free communications session for physiology education, in addition to the Sunday workshop and a symposium.

Through all of this the key principle informing my teaching practice that they are all evidence based approaches to improve student learning and engagement. My approach isn't truly innovative, as I'm not developing something from scratch and then experimenting on the students. However, I think it's important to see what is available and if there is good evidence it works elsewhere then the innovation is adapting it to a new context.

What do you see as the current and future challenges in physiology education.

I think for all of higher education it is how to keep students learning effectively in the ever increasing on-line environment. I believe most students still want a "University experience", so getting the balance right, whereby content can be learnt effectively online but when they are on campus they are actively learning and extending themselves is a key challenge. For academics another challenge is sorting through which technologies are going to be effective at improving student learning and which are merely shiny new toys. Just because a teaching approach incorporates new technology doesn't always make it better for student learning. I think the key here is to examine if there is any evidence to back it up and just like we would do for our research programs to properly test it out – and then disseminate the findings (including at our meetings) so your peers know if it's useful or not.

I am honoured to have received the Michael Roberts teaching award and would like to thank AuPS for all the opportunities that I've had by being a member and for its commitment to physiology education. I do believe it's possible to be a balanced academic with a quality teaching and research program and AuPS provides a very valuable service through its commitments to both research and education.

The Michael Roberts Excellence in Physiology Education Award

The Michael Roberts Excellence in Physiology Education Award, is an award bestowed by the Australian Physiological Society in memory of Professor Michael Roberts who was a lifelong passionate and dedicated advocate of physiology teaching and education. The award is intended to recognise AuPS members who have demonstrated a sustained performance of excellence in the delivery of physiology education at the tertiary level, and make a contribution to the teaching activities of AuPS.

A/Prof Glenn Wadley was awarded the Michael Roberts Excellence in Physiology Education Award at the AuPS 2017 Scientific Meeting. A/Prof Wadley will present the Roberts Award Lecture at the 2018 AuPS meeting in Sydney.

Nominations for the 2018 Roberts Award close on **26th October 2018.**

See the AuPS website for further details.

Did you know??

We are increasing our ways of communicating our achievements to the wider world. AuPS now has a twitter page!

Don't forget to follow us and use our twitter handle when you want to communicate the achievements of our members @AuPhysiolSoc

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Mid-year update from the AuPS National Secretary

Dr Deanne Skelly, Griffith University

It is hard to believe that we are half way through 2018. The successful Melbourne meeting in 2017, hosted by Monash Institute of Pharmaceutical Sciences was well received by all. The excellent quality of the science from our society, with a special mention of our student and ECR members, demonstrates the strengths of our field as a whole. Sincere thanks to Natalie Trevaskis and her team for the seamless running of the meeting. I am sure you will all agree that the dinner at the Melbourne Museum was very memorable and an exciting location.

At the end of 2017 we had some new members join the council. Lea Delbridge (University of Melbourne) retired from her role on council. Natalie Trevaskis (Monash), Nicole Beard (University of Canberra) and Richard Mills (ECR: University of Queensland) were appointed on council. We have recently had a call for 2 new councillors, and an election will occur in the coming months. I am very pleased by the number of people we have had nominate over the last 2 years and we appreciate diverse representation on our council. Our current council consists of early-career, mid-career and more senior physiologists. Giselle Allsopp (Deakin University) is the current student member on council. Nomination for a second student member on council has occurred, and the voting is underway! I recently announced the outcomes from the AuPS PhD grants. Greg Quaife-Ryan (University of Queensland) and Paris Papagianis (Monash University) were awarded grants, from a very competitive field, towards the costs for their research. Congratulations again!

In 2018, we will be conducting our annual meeting at The University of Sydney, from Sunday 25th November to Wednesday 28th of November. This campus is easily accessible from Darling Harbour using public transport. The program includes a broad range of topics focused on a number of different areas including developmental physiology, genome and epigenome of exercising skeletal muscle, metabolic implications of vascular dysfunction and rigor and reproducibility in physiological research. We are particularly excited that 2 symposia on ion channels have been sponsored by the Journal of Physiology. Great work from the team in Sydney to organise this.

We are pleased that Livia Hool (University of Western Australia) will be presenting the AuPS Invited Lecture, and Glenn Wadley (Deakin University) will be presenting the Michael Roberts Excellence in Teaching Award lecture. We will be calling for abstracts a little earlier this year due to the early timing of the meeting.

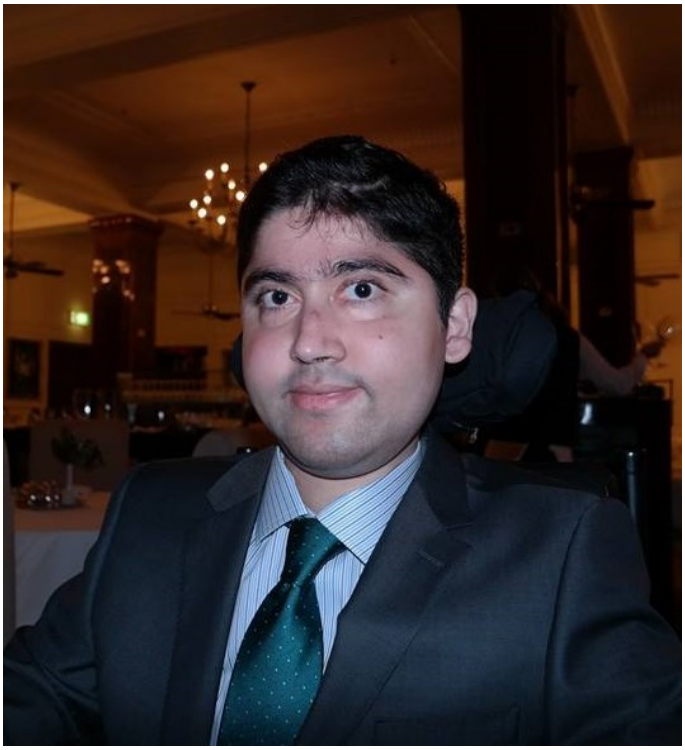
We are looking forward to the joint Australian Physiological Society/Australian Society for Biophysics meeting in 2019 being hosted by the Australian National University, working with the University of Canberra. Stefan Broer will be the local organising chair. Call for symposia will be made via the electronic format in August this year, with submissions at the end of October. Our annual prizes for Michael Roberts Teaching Award, AK McIntyre Award, the Post-Doctoral and PhD publication prizes will also be called about that time. I look forward to seeing as many of you as possible in Sydney in November.

Dr Deanne Skelly

Australian Physiological Society National Secretary

Email: d.skelly@griffith.edu.au

Student Member Profile:
Savant Thakur, University of Melbourne



Savant was awarded the AuPS prize for the best poster presentation at the 2017 Scientific Meeting in Melbourne.

The prize was proudly sponsored by SDR scientific.

Can you tell us about your current role and the research you are involved with?

I am a third year PhD candidate at the Basic and Clinical Myology Laboratory within the new Centre for Muscle Research (CMR) in the Department of Physiology at the University of Melbourne, under the supervision of Prof Gordon Lynch, Dr Kristy Swiderski and Dr James Ryall. My research broadly examines the role of heat shock proteins (HSPs) in skeletal muscle biology with a specific focus on elucidating the cellular and molecular mechanisms through which HSPs regulate skeletal muscle development and muscle regeneration in response to injury. I am particularly interested in investigating ways that HSP modulation can be used to enhance muscle repair and growth in different models of muscle wasting.

How did you begin your career in Physiology?

Ever since I was diagnosed with Duchenne Muscular Dystrophy (DMD) at the age of 4, I curiously began exploring the causes of my weakness and increasingly became fascinated by the molecular processes that go wrong in DMD. I challenged myself to do something to improve the lives of everyone with Duchenne and decided in my high school years that getting involved in biomedical research was the best way to do this. This desire was reinforced during my frequent trips to the Royal Children's Hospital, where I experienced first-hand the wonderful work done by world-leading clinicians and researchers.

I pursued a Bachelor of Biomedicine degree at The University of Melbourne majoring in Biochemistry and Molecular Biology. During the third year of undergraduate study, I had the opportunity to work on a research project in Prof Gordon Lynch's lab and really enjoyed the first taste of muscle research! I subsequently completed my Honours in Physiology under Prof Lynch's supervision, examining the role of suppressor of cytokine signalling 3 (SOCS3) in defective skeletal muscle repair. After receiving grades of high first-class honours I was offered a scholarship to commence my PhD, which I gladly accepted!

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

After completing my Ph.D., I plan to undertake post-doctoral research investigating novel treatments for muscular dystrophies and other muscle wasting conditions (including cancer cachexia and sarcopenia). I want to gain international experience and expand my repertoire of experimental skills by learning exciting techniques and methods at the forefront of muscle biology. I also hope to engage in undergraduate teaching, and supervision and mentorship of graduate research students.

Can you tell us about your award winning poster presentation?

Skeletal muscle has an extensive regenerative capacity following injury due to a quiescent population of adult stem cells (MuSCs). MuSCs become activated in response to injury and undergo multiple bouts of proliferation, differentiation and fusion to form multinucleated myotubes, which mature into myofibres. During these events dramatic changes occur in protein homeostasis that cause cellular stress. Organisms have evolved a protective mechanism against cellular stress in the form of heat shock proteins (HSPs), which prevent stress induced protein unfolding and aggregation. Our preliminary data suggests that Hsp70 levels increase during early stages of muscle differentiation relative to proliferating cells. To better understand the roles of Hsp70 in myogenesis, we transiently transfected plasmid DNA encoding GFP alone (control) or a GFP-Hsp70 fusion protein into proliferating C2C12 myoblasts and assessed the effects on cell proliferation, differentiation and fusion. We found that GFP-Hsp70 overexpression did not affect the rate of C2C12 cell proliferation or early differentiation but resulted in large increases in both the median number of myonuclei per myotube and median myotube width relative to GFP at four days post-differentiation. These results indicate that enhanced Hsp70 expression strongly promotes myoblast fusion with potential for treating muscle injuries, augmenting responses to resistance exercise and possible implications for cell transplantation therapies for muscle wasting disorders.

What was your experience of the AuPS meeting in 2017?

I had a great time at AuPS 2017 meeting and thoroughly enjoyed it. It was a privilege to hear from an impressive line-up of leading experts and my peers in the high quality symposia and free communication sessions. There were plenty of networking opportunities, fostering development of new friendships. It was extremely invaluable to receive first-hand advice and mentorship from other PhD students, ECRs and advanced researchers. The excellent conference dinner at the Melbourne Museum had to be the highlight, where it was an honour to be announced as the winner of the best poster prize in front of the society.

What do you like to do in your spare time?

I have a strong passion for community engagement and spend my spare time promoting awareness of Duchenne research (and scientific research in general) among public, patient groups and social media circles. My other interests include watching sports – AFL (die-hard Western Bulldogs fan), cricket (test match lover) and soccer (Man Utd fan), viewing science and war documentaries, watching movies, social networking, shopping and dining out.

Savant's was awarded the poster prize for the presentation:

'Heat shock protein 70 (Hsp70) overexpression drives myoblast fusion during C2C12 cell differentiation'

Physiological Society of Japan Annual Meeting 2018: Associate Professor Bradley Launikonis,

University of Queensland

Above: Enjoying dinner with Dr Takashi Murayama, Jutendo University.

The joint AuPS with the Physiological Society of Japan (PSJ) symposia have been successful for a number of years now. In 2017 two Japanese scientists attended the AuPS Meeting in Melbourne and spoke in a symposia chaired by Prof Graham Lamb. In 2014, a number of Japanese scientists attended the meeting in Brisbane (at University of Queensland), many more than the two who presented in the joint symposia. This included Prof Yoshihiro Kubo (*Journal of Physiology* senior editor and PSJ President). These meetings have been very rewarding for exchange of ideas and networking. As part of the continuing relationship with the PSJ, I attended the 2018 PSJ Annual Meeting in Takamatsu, Japan, in March.

Prior to the meeting, I took the opportunity to visit Tokyo and the lab of Prof Nagomi Kurebayashi and Dr Takashi Murayama at Juntendo University. Takashi presented very impressive work on novel drugs targeted to ryanodine receptors at the AuPS Meeting in 2017, and Nagomi had been the first to identify store-operated Ca^{2+} entry (SOCE) in skeletal muscle, presented in a seminal *J.Physiol* paper in 2001 (that I have cited many times).

At Juntendo I presented our new work on SOCE in skeletal muscle, which built upon Nagomi's work showing how this Ca^{2+} influx mechanism is activated following every action potential in the muscle.

Afterwards, I was treated to a traditional Japanese dinner (of about 6 or so courses) with Nagomi, Takashi and some of their colleagues. I have now had my first experience of eating fish head …not bad!

Takamatsu was a short flight to the south of Japan from Tokyo. The PSJ Meeting was attended by more than 1000 scientists. There was some excellent physiology presented, including work showing that junctophilin is responsible for the localization of the DHPR at the ryanodine receptor in skeletal muscle (now published in *Proc Natl Acad Sci USA*). There was a "Group Dinner" for those working muscle. This was an opportunity to meet more of those working broadly in the same field; including other invited speakers in attendance from Monash University and Oxford (both smooth muscle scientists).

Above: My first experience of eating fish head.

Above: Cherry Blossom in the gardens of Takamatsu

The AuPS-PSJ symposium was themed as *Recent advances in cardiac, smooth and skeletal muscle physiology*, co-chaired by Prof Ryuji Inoue and myself. This symposium had 3 Japanese speakers: Nagomi, Hikaru Hashitani (previously a postdoc at Monash University) and Aya Yamamura; and myself.

The symposium was well attended and gave me the opportunity to present our latest work on Ca^{2+} dynamics at the junctional membranes of human muscle fibres. Following the symposium my new Japanese colleagues, showed me a very hospitable evening. The association some Japanese have with Australia led to me being asked several times to sing Olivia Newton-John at Karaoke later that evening. I compromised and went with Oasis. Some of you who attended AuPS Meeting in Adelaide, 2016, will know how bad that may have been.

Overall, the exchange was very successful and rewarding. I certainly hope the joint AuPS & PSJ symposia continue.

Associate Professor Bradley Launikonis

University of Queensland

The 9th Federation of Asian and Oceanian Physiological Sciences (FAOPS) congress will take place in Kobe, Japan in 2019:

9th FAOPS CONGRESS 2019

KOBE JAPAN March 28-31, 2019

PHILOSOPHY OF LIFE: FUNCTION AND MECHANISMS

A Glimpse Ahead - AuPS 2018 hosted by the University of Sydney

We on the local organising committee (LOC) are delighted to invite both members and non-members to Sydney for what we hope will be a memorable 2018 AuPS annual scientific meeting. The meeting will feature plenary talks by Livia Hool and Walter Boron, 10 symposia and many free oral and poster presentations on physiology research and teaching.

Aim to arrive by mid-afternoon on Sunday Nov 25 for the Sunday plenary lecture at 5pm and a Welcome Reception in the neo-Gothic (and slightly spooky), Anderson Stuart Building.

Monday evening there will be an ECR workshop and social mixer. For those of us who are no longer quite in early career, a short stroll to neighbouring Newtown or Glebe will be rewarded with a panoply of dining pleasures.

Tuesday night we will all come together for the conference dinner in the glitzy heart of Darling Harbour.

Abstract, registration and other details will be progressively announced in coming weeks via the AuPS website and by email.

We hope you will plan to be part of AuPS 2018 and bring your students and colleagues along. We are certainly look forward to hosting you.

Sydney AuPS 2018 Local Organising Committee:

Melissa Cameron,
Discipline of Physiology University of Sydney

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Head of Physiology, Western Sydney University

Trevor Lewis,
Physiology, School of Medical Sciences, UNSW Sydney

Andrew Moorhouse,
Physiology, School of Medical Sciences, UNSW Sydney

William (Bill) Phillips,
Discipline of Physiology University of Sydney

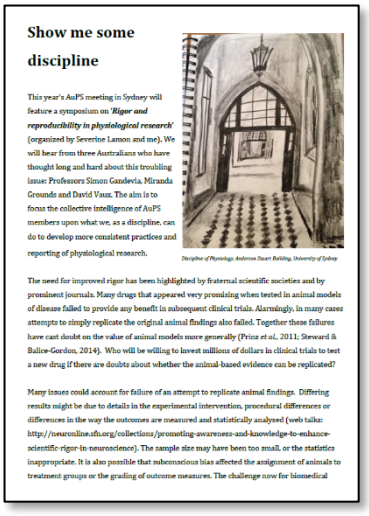
Symposium Preview:

Rigor and Reproducibility in Physiological research

Rigor and Reproducibility in Physiological research is the important focus of a symposium at AuPS 2018. Ensuring reproducibility in preclinical research, in the face of many publicised failures, is a challenge for all experimental physiologists. Professors Simon Gandevia (NEURA), David Vaux (WEHI) and Miranda Grounds (UWA) will discuss aspects of this problem, followed by a panel Q&A session. Deficiencies of experimental rigor and reproducibility affect our credibility as a discipline. We all need to think deeply about this problem and become part of the solution.

Please **click here to download** and read a pdf article '*Show me some discipline'* which provides an introduction and some context to this thorny challenge.

Severine Lamon and Bill Phillips (the symposium organisers).



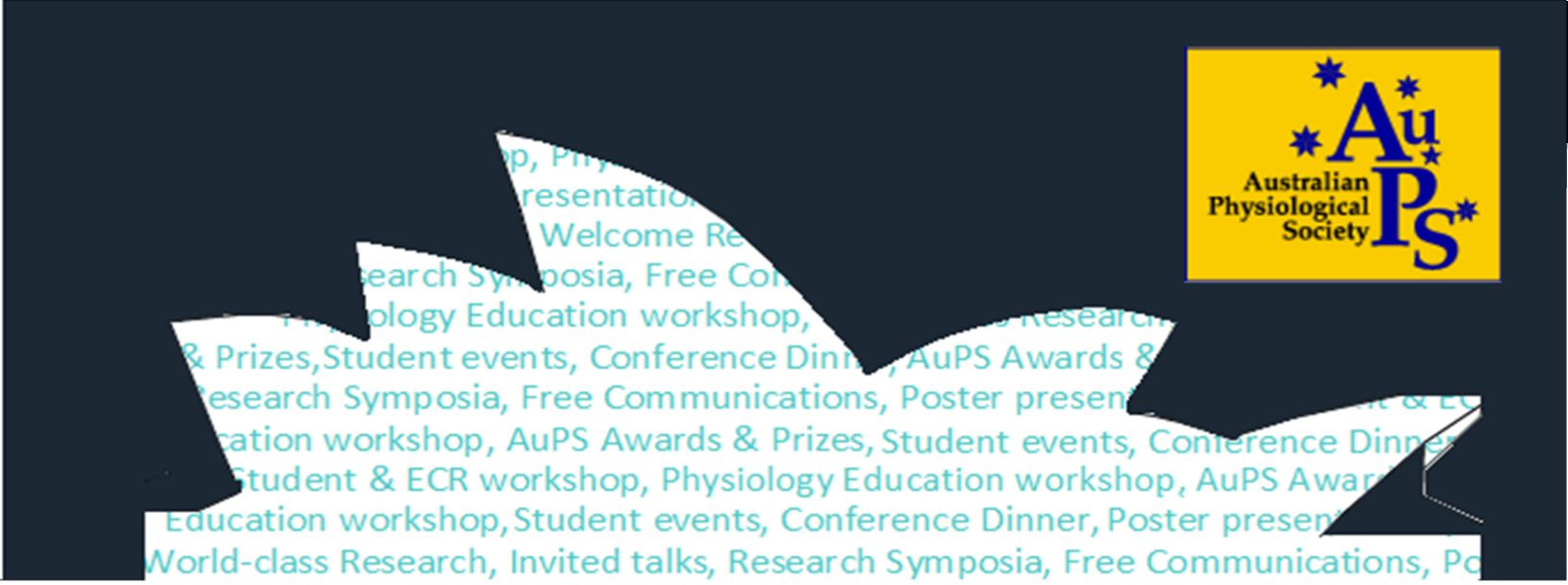
Show me some discipline

This year's AuPS meeting in Sydney will feature a symposium on ***'Rigor and reproducibility in physiological research'*** (organized by Severine Lamon and me). We will hear from three Australians who have thought long and hard about this troubling issue: Professors Simon Gandevia, Miranda Grounds and David Vaux. The aim is to focus the collective intelligence of AuPS members upon what we, as a discipline, can do to develop more consistent practices and reporting of physiological research.

Discipline of Physiology, Anderson Stuart Building, University of Sydney

The need for improved rigor has been highlighted by fraternal scientific societies and by prominent journals. Many drugs that appeared very promising when tested in animal models of disease failed to provide any benefit in subsequent clinical trials. Alarmingly, in many cases attempts to simply replicate the original animal findings also failed. Together these failures have cast doubt on the value of animal models more generally (Prinz et al., 2011; Steward & Balice-Gordon, 2014). Who will be willing to invest millions of dollars in clinical trials to test a new drug if there are doubts about whether the animal-based evidence can be replicated?

Many issues could account for failure of an attempt to replicate animal findings. Differing results might be due to details in the experimental intervention, procedural differences or differences in the way the outcomes are measured and statistically analysed (web talk: http://neuronline.sfn.org/collections/promoting-awareness-and-knowledge-to-enhance-scientific-rigor-in-neuroscience). The sample size may have been too small, or the statistics inappropriate. It is also possible that subconscious bias affected the assignment of animals to treatment groups or the grading of outcome measures. The challenge now for biomedical



AUSTRALIAN PHYSIOLOGICAL SOCIETY

2018 SCIENTIFIC MEETING

25-28 November 2018

Hosted by University of Sydney

ABSTACT SUBMISSIONS OPEN 13th AUGUST

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aups.org.au

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Other Upcoming Events:

The Physiological Society, the Scandinavian Physiological Society, the Deutsche Physiologische Gesellschaft and the Federation of European Physiological Societies are delighted to be co-hosting a series of biennial joint meetings.

The series will begin in London from 14 - 16 September 2018 at the QEII Centre in the heart of Westminster, and will subsequently be organised in Germany in 2020 and Scandinavia in 2022. The Europhysiology meetings will be the main meeting of the partner societies in these years.

The Presidents of the partner societies commented, "We are delighted and excited about this historic initiative that will bring together the three biggest physiological societies in Europe and the Federation of European Physiological Societies in such a collaborative fashion. Science should be borderless and we hope this venture will appeal not only to members of our respective societies, but also the wider international physiological community."

ACSM Conference on
Integrative Physiology of Exercise

Sheraton San Diego Hotel & Marina
San Diego, California, USA
September 5-8, 2018

Earn 22 CECs

This conference has been endorsed by:

aps American Physiological Society

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JOINT ANNUAL SCIENTIFIC MEETING
MELBOURNE AUSTRALIA | MCEC | OCTOBER 16 - 18 2018
WWW.ANZOS-MDO2018.ORG

anzos australian & new zealand obesity society

MONASH BIOMEDICINE DISCOVERY INSTITUTE

Breakthrough Discoveries in Metabolism, Diabetes and Obesity is pleased to announce registrations and abstract submissions are now open!

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This issue of AuPS News was compiled by Chris Shaw with many thanks to the generous contributors.

The next issue of AuPS News will be distributed to members in September 2018.
All contributions for AuPS News should be sent to: newsletter@aups.org.au before the end of August.