



AuPS News

September 2016

A.K. McIntyre Award Winner 2015 Dr Natalie Trevaskis, Monash University



Dr Natalie Trevaskis being congratulated on her McIntyre award at the 2015 Hobart Meeting by AuPS Secretary Prof Matthew Watt.

What is your research background? How did you begin your career in Physiology?

I began my career as a Pharmacist. My school chemistry teacher encouraged me to study Pharmacy as I had a vague idea that I would pursue a research career in medicinal chemistry. In the first year of the Bachelor of Pharmacy degree I was surprised to find my favourite subject was physiology! Everything about how the body works fascinated me. At the end of my Bachelor degree I qualified and worked as a pharmacist but was soon drawn back to biomedical research and commenced a PhD in pharmaceutical science at Monash with advisors Prof Bill Charman and Prof Chris Porter. My PhD thesis was focussed on physiological factors that influence drug delivery to the intestinal lymphatic system, particularly intestinal lipid absorption processes.

President

Prof Graham Lamb
La Trobe University
president@auaps.org.au

National Secretary

Prof Matthew Watt
Monash University
secretary@auaps.org.au

Treasurer

Prof Aaron Russell
Deakin University
treasurer@auaps.org.au

Editor

Prof. David Allen
The University of Sydney
editor@auaps.org.au

IT Manager & Production Editor

Hon A/Prof Dave Davey
ITmanager@auaps.org.au

Webmaster & Assoc Editor

Dr Glenn Wadley
Deakin University
webmaster@auaps.org.au
newsletter@auaps.org.au

Membership Officer

Dr Séverine Lamon
Deakin University
severine.lamon@deakin.edu.au

Student Representatives

Tahnee Kennedy
The University of Melbourne
t.kennedy2@student.unimelb.edu.au

Nicole Vargas
Charles Sturt University
nvargas@csu.edu.au

Councillors

Dr James Bell
The University of Melbourne
belljr@unimelb.edu.au

Prof Lea Delbridge
The University of Melbourne
imd@unimelb.edu.au

Prof Gary Housley
The University of NSW
g.housley@unsw.edu.au

Dr Kimberley Mellor
The University of Auckland
k.mellor@auckland.ac.nz

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[AuPS Website](#)

My PhD work attracted interest from industry and was followed by post-doc positions sponsored by Pfizer and Novartis. The project with Pfizer demonstrated that the torcetrapib series of CETP inhibitors, which were in development as atherosclerosis treatments, associate with and inhibit intestinal lymph lipid transport pathways. The project with Novartis focused on the intestinal lymphatic uptake of a cannabinoid 2 receptor agonist for the treatment of inflammation. I was particularly intrigued by my data showing that lipid ingestion stimulates lymphocyte and lipophilic drug flux into the lymph and can be utilised as a mechanism to co-localise high concentrations of drugs and lymphocytes at the one site. These early projects as well as emerging literature highlighted to me the strong interdependence between the immune system and lipid metabolism. This is particularly true in the lymphatic system which co-transport immune cells, antigens and lipids and interacts with surrounding adipose tissue.

What research are you currently involved with?

My research lab is focussed on the role of lymphatics in immune-metabolic diseases and the development of medicines that target the lymphatic system to more effectively treat these diseases. The lymphatic vessels were once considered like a pipe that drains 'white blood' - excess fluid, lipids and immune cells - from tissues back to the blood circulation. In the last 10-15 years there has been rapid progress in our basic understanding of the physiological function of lymphatics and the role of lymphatics in a range of diseases. Rather than being passive 'pipes', the lymphatic vessels and nodes are dynamic structures, constantly changing in response to the surrounding environment, communicating with surrounding tissue and actively regulating the transport of fluids, lipids, antigens and immune cells etc.

My largest project is focussed on the potential to treat obesity and metabolic disease by targeting lymph-adipose interactions. It involves a collaboration with Prof Matt Watt (who I also thank for introducing me to the Australian Physiological Society!), Prof Chris Porter and Dr Darren Creek. We and others have recently found that intestinal lymphatics become mispatterned and 'leaky' in response to high fat diets. This results in increased lymph access to surrounding fat. Lymph promotes fat expansion and pathogenic changes that appear to stimulate insulin resistance. We next aim to establish the potential to attenuate the pathogenic changes in fat using our novel drug delivery approaches that target lymph/fat interactions. This project is exciting as it has significantly advanced our understanding of the fundamental biology that underpins lymphatic function and metabolic diseases and has the potential to lead to completely new mechanisms to treat metabolic disease.

Another project we are working on aims to develop novel treatment strategies for acute and critical illnesses (ACI) that target toxic factors in the gut-lymph. ACI include sepsis, trauma, haemorrhage, shock and acute pancreatitis. Worldwide, 20 million people per year are admitted to intensive care units with ACI and of these 30% die. ACI thus represent a major clinical challenge. The current management of ACI consists of generic measures such as fluid resuscitation, enteral feeding, antibiotics and organ support. Our clinical collaborators from Auckland, Prof John Windsor, Dr Anthony Phillips and Dr Max Petrov have found compelling evidence that toxic factors enter lymph from the gut in ACI and that subsequent entry of 'toxic' gut-lymph into the blood promotes organ dysfunction/failure and ultimately death. Together we are working to design more effective and specific treatments for ACI that target and inactivate toxic factors in gut-lymph. I am very excited by this project as we have a strong focus on clinical translation.

What's the best thing about your lab at the moment?

Without a doubt it is the people. I am privileged to work with an outstanding, bright and enthusiastic team of students, assistants, post-docs, colleagues and collaborators. The Monash Institute of Pharmaceutical Sciences is a special place where we are encouraged to dream large. The labs are abuzz with people from various backgrounds working together to address major health problems.

Which part of research makes it most enjoyable for you?

There has been such rapid progress in our understanding of the fundamental function of the lymphatic system in the last few years - initiated by findings from such diverse fields as cancer biology, immunology, lipid metabolism, engineering, imaging techniques, vaccine and drug delivery. The work on lymphatics across a number of disciplines constantly inspires me to come up with new ideas and to challenge my perceptions of fundamental aspects of physiology and pharmaceutical science. Playing a part in the revitalisation of lymphatic research is just amazing. The other aspect of my work which is

most enjoyable is supervision of postgraduate students. I get great joy from seeing my students develop and succeed.

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

Dysregulation of immunity and metabolism promote the development of almost all chronic diseases. In the next few years I plan to continue my work to advance our understanding of lymphatic function in immune-metabolic diseases and to develop medicines that target the lymphatics to treat these diseases. I am particularly excited about our plans to translate our lymph targeted treatments into the clinic in the next few years.

What do you do to relax?

I spent my childhood outdoors and from this grew to love running, especially through the bush. I try to get out amongst the trees at least a couple of times a week. I also enjoy weekend activities and travelling with my husband and three children.

A.K. McIntyre Award

Sponsored by SDR Scientific

The Society's prestigious A.K. McIntyre award, named in honour of the Society's first President, is awarded annually to a member of the Society who is judged to have made significant contributions to Australian physiological science over their pre-doctoral and early post-doctoral years.

Applicants must be financial Ordinary Members of the Society, and must normally have completed their doctoral degree not more than 7 years prior to the time of their application (PhD graduation after 1 November 2009). They must be proposed by two financial members of the Society, who should each provide a statement of not more than 500 words summarising their achievements. The applicant should also provide a curriculum vitae which includes any involvement with AuPS, along with a list of published works, including conference proceedings.

The Prize consists of a medal and the sum of \$1000. The prize winner will be announced at the AuPS meeting in Adelaide in December.

The application deadline is 28th October 2016.

Eligibility and selection criteria can be found here: <http://aups.org.au/Prizes/McIntyre.html>

Please email applications to the National Secretary, Matthew Watt secretary@aups.org.au

Details of other AuPS prizes can be found at the back of this newsletter and on our website.

Report on the 93rd Annual Meeting of the Physiological Society of Japan Sapporo March 22nd – 24th 2016.

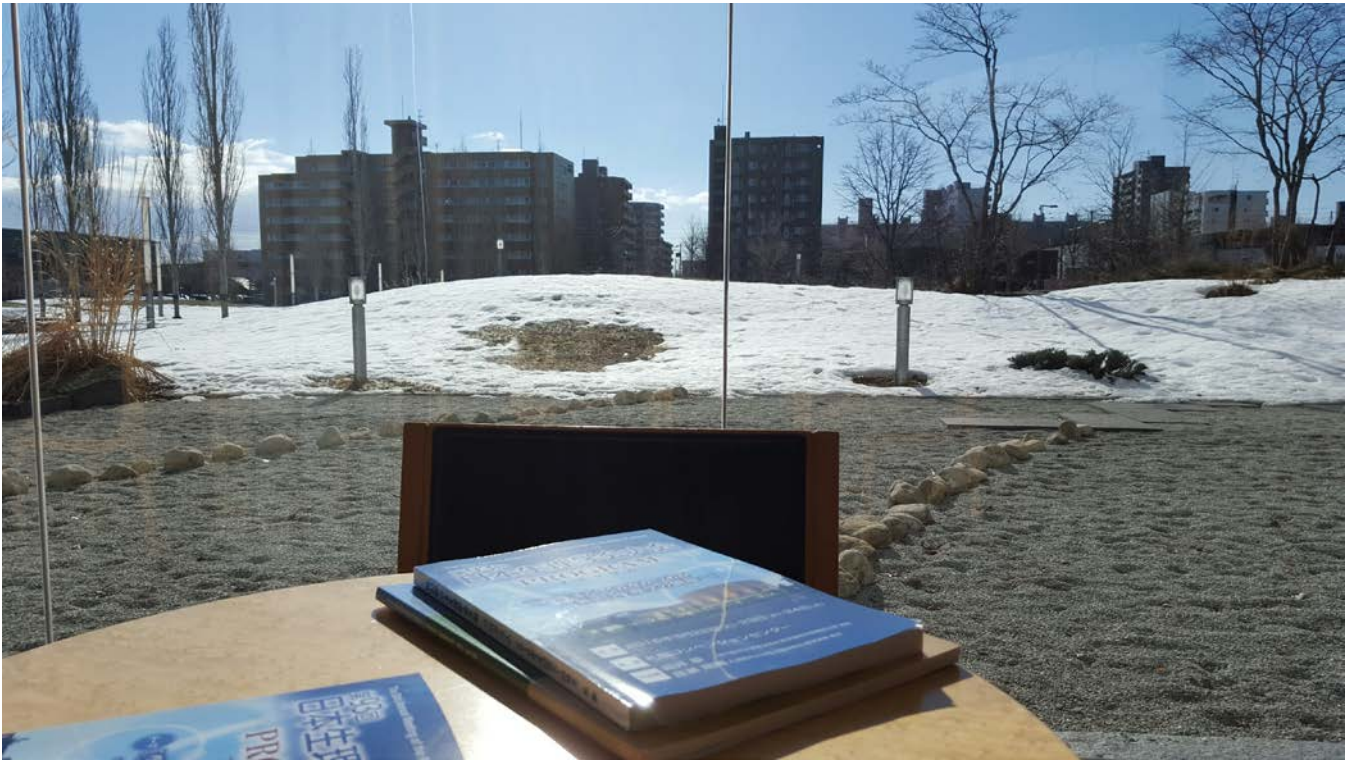


Over the past few years the Australian Physiological Society has built close ties with the Japanese Physiological Society, with a commitment to sponsor exchange through joint Symposia at each Society's meetings. These exchanges provide opportunities to build research collaborations and provide a focus point around the topics of the symposia. It also more broadly strengthens the discipline of Physiology by bringing together the Societies. The Japanese Physiological Society held their 93rd meeting this year. They have a membership of more than one thousand. The venue was the convention centre in Sapporo in late March and it was snowing when I landed at New Chitose Airport, and it snowed again while were inside

the Sapporo Beer garden at the "Party" on the last evening, turning it into a Christmas scene of snow-capped mountains and fairy lights – a perspective lent from festive nature of the party. I attended the meeting as one of two sponsored Australian physiologists, along with David Ryugo from the Garvan Institute, to speak within the "Japan – Australia Joint Symposium - Toward FAOPS2019 – Recent advances in hearing research: From Channel to behavioural regulation". The Japanese speakers were Kuba Hirosh from the Department of Cell Physiology at Nagoya University (central auditory plasticity) and Hibino Hiroshi from the Department of Molecular Physiology at Niigata University in Osaka (cochlear electrochemical homeostasis).

Photos courtesy of Prof Gary Housley, UNSW





I spoke about cochlear efferent feedback control of sound transduction and David Ryugo spoke about changes in central auditory pathway synaptic organization following loss of sensory input. There were also joint international symposia with China and South Korea in the “Towards FAOPS2019” theme, as well as symposia with the French Neuroscience Society and many joint symposia with National Societies, such as the Japanese Pharmacology Society, Biophysics Society, Company of Anatomists, Neurology, Exercise Physiology. On reflection, this lateral engagement could present an interesting opportunity for AuPS, as it expands linkages without the challenges of running joint conferences, which would not be achievable on an annual basis across multiple allied societies. On behalf of David Ryugo and myself, we thank the Australian Physiological Society for co-sponsoring our attendance at the meeting, and also our thanks to our host – Professor Junichi Nabekura, deputy director of NIPS – the National Institute for Physiological Sciences in Okazaki (which I visited just prior to the meeting). Our thanks also to the Presidents of the meeting – Professor Akira Takai (Asahikawa Medical University) and Professor Noritsugu Tohse, Sapporo Medical University and to the Council of the Japanese Physiological Society for their sponsorship and hospitality during our visit.

Gary Housley

Chair and Head of Dept. Physiology, UNSW Australia, Sydney.



AuPS/ASB Adelaide 2016



Australian Physiological Society &
Australian Society for Biophysics
City West Campus,
University of South Australia,
Adelaide, Dec 4-7, 2016

PHYSIOLOGY AND BIOPHYSICS RESEARCH

There are 13 international speakers presenting at 13 physiology research symposia across the 4 day conference and keynote lectures by:

- Professor Lea Delbridge: *Cardiac adventures in autophagy*
- Professor Suzanne Scarlata: *Caveolae membrane domains connect G protein-mediated calcium signals with mechanical deformation*

PHYSIOLOGY EDUCATION

There will be dedicated Education symposia as well as a workshop and keynote address:

- Pre-conference Physiology Education Workshop: *Developing teaching resources to aid with large scale teaching and assessment*
- Keynote address from Dr Julia Choate, 2015 Michael Roberts Education prize winner

CONFERENCE DINNER AT THE ADELAIDE OVAL

The conference concludes with dinner at the world-renowned Adelaide Oval on Tuesday 6 December

[REGISTRATION & ABSTRACT SUBMISSION NOW OPEN](#)
(Early-bird registration and abstract submissions close 7th October 2016).

Local Contact: Prof Janna Morrison janna.morrison@unisa.edu.au

Michael Roberts Award

Sponsored by Wiley-Blackwell

The Michael Roberts Excellence in Physiology Education Award is an award bestowed periodically 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.

The recipient of this Award in 2016 will receive a medal and a cash award, which will be presented at the Conference dinner at this year's AuPS Adelaide Meeting, and will be invited to deliver a lecture during the Educational Symposium at the 2017 AuPS Melbourne Meeting.

The application deadline is 28th October 2016.

Eligibility and selection criteria can be found here: <http://aups.org.au/Prizes/Roberts.html>

Please email applications to the National Secretary, Matthew Watt secretary@aups.org.au

AuPS Postdoctoral publication prize

Sponsored by SDR Scientific

An annual award for the best original paper published by an AuPS member during their first 4 postdoctoral years.

The Prize consists of a \$500 cheque. The prize winner will be announced at the AuPS meeting in Adelaide in December. The paper must be published (on paper or online) between 30th September 2015 and 1st October this year. The award must be used to present work at a conference. Winners will be reimbursed after providing a copy of an invoice of conference expenses.

The application deadline is 28th October 2016.

Eligibility and selection criteria <http://aups.org.au/Prizes/PostDocPublication.html>

Please email applications to the National Secretary, Matthew Watt secretary@aups.org.au

AuPS PhD student publication prize

Sponsored by SDR Scientific

An annual award for the best original paper published by an AuPS member during the course of their PhD studies.


The Prize consists of a \$500 cheque. The prize winner will be announced at the AuPS meeting in Adelaide in December. The paper must be published (on paper or online) between 30th September 2015 and 1st October this year. The award must be used to present work at a conference. Winners will be reimbursed after providing a copy of an invoice of conference expenses.

The application deadline is 28th October 2016.

Eligibility and selection criteria can be found here:

<http://aups.org.au/Prizes/PhDpublication.html>

Please email applications to the National Secretary, Matthew Watt secretary@aups.org.au





The 94th Annual Meeting of the Physiological Society of Japan

March 28 (Tue) – 30 (Thu), 2017
ACT CITY Hamamatsu

Presidents
Tetsumei Urano, MD, PhD
(Professor, Department of Medical Physiology, Hamamatsu University School of Medicine)
Atsuo Fukuda, MD, PhD
(Professor, Department of Neurophysiology, Hamamatsu University School of Medicine)

*Illuminating the mechanisms of life
from the harmony of molecules
to the dynamics of organisms*

Pre-registration period
September 9, 2016–January 13, 2017

Abstract submission period
September 9, 2016–October 31, 2016

<http://www.procomu.jp/seiri2017/english/index.html>



aps Intersociety Meeting:
The Integrative
Biology of Exercise VII

November 2-4, 2016 • Phoenix, AZ

PURPOSE

Join us for the seventh APS Intersociety Meeting: The Integrative Biology of Exercise which is held in conjunction with the American College of Sport Medicine (ACSM) every four years for researchers interested in exercise physiology. Connect with peers at this exciting meeting to discuss exercise physiology as it relates to topics including brain cell stress responses, metabolic diseases, mitochondrial signaling, sedentary behavior, exercise and pregnancy, cardiovascular disease, aging, and stem cells.

DEADLINES

Abstract: June 30

Registration: October 3

Housing: October 18

LOCATION: Phoenix, Arizona

<http://www.the-aps.org/exercise>

Metabolic Diseases;

Breakthrough Discoveries
in Diabetes & Obesity

Novotel Melbourne
St Kilda

1-2 December 2016

Plenaries

Joel Elmquist,
University of Texas
Southwestern Medical Centre

Philipp Scherer,
University of Texas
Southwestern Medical Centre

Keynote

David James,
Charles Perkins Centre,
University of Sydney

Internationals

Anton Bennett,
Yale School of Medicine
Frank Reimann,
University of Cambridge
Matthew Rodeheffer,
Yale School of Medicine
Scott Summers,
University of Utah
Jun Wu,
University of Michigan

Symposium

Michael Cowley,
Monash University
Mark Febbraio,
Garvan Institute
Jenny Gunton,
University of Sydney
Leonie Heilbronn,
University of Adelaide
Herbert Herzog,
Garvan Institute
Sean McGee,
Deakin University
Stephen Simpson,
University of Sydney
Matt Watt,
Monash University
Rob Yang,
University of New South Wales

The overarching goal for the meeting is to provide a forum for the exchange of ideas between the academic, clinical and pharmaceutical communities, to develop an integrative understanding of pathogenesis and strategies for combating obesity, type 2 diabetes and their associated complications.

Key Dates

1st Oct 2016

Early Bird Deadline

1st Oct 2016

Oral Abstract Deadline

1st Nov 2016

Poster Abstract Deadline

www.mdo.events

Thanks to our Sponsors



Journal of Neuroendocrinology



Meeting Topics

Insulin Resistance
Immunometabolism
Adipose Tissue Metabolism
Central Circuitry
Energy Homeostasis
Metabolic Crosstalk

<http://www.mdo.events/>

Dear Student Members,

We are excited to connect with you through social media!! A new student and early career researchers member page has been developed on Facebook! The page is titled: **Australian Physiological Society - Students and Early Career Researchers.**



The aim of this page is to provide another means to inform our student members and ECR's about upcoming events, awards/scholarships that are available and also important registration and submission dates. We will also aim to post new information about jobs and postdoc positions that are circulated to members, as well as highlight our student member of the month with some information about their area of research and accomplishments!

Privacy: It is important to note that, as Facebook is a social media page, your profile will be accessible to the page administrators, Tahnee Kennedy and Nicole Vargas (your current student representatives). The page will, in no way, be used for determining awards/scholarships, council positions and the like. Also, note that while your profile will be open to page administrators, other individuals who like the page will not have access to your page, unless your privacy settings allow it.

At this time, we would love to ask you to 'like' our Facebook page if you are a student member or early career researcher!! We are very excited to open these lines of communication and hope that they will keep everyone in the loop!

Thanks for your support and we'll see you on Facebook!!

Kind Regards,
Tahnee Kennedy and Nicole Vargas
AuPS student representatives

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 December 2016. All contributions for AuPS News should be sent to: newsletter@ups.org.au before the end of November.