

# AUPS/ASB 2019 SCIENTIFIC MEETING

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A JOINT MEETING OF  
**THE AUSTRALIAN PHYSIOLOGICAL SOCIETY**  
&  
**THE AUSTRALIAN SOCIETY FOR BIOPHYSICS**

1<sup>ST</sup>-4<sup>TH</sup> DECEMBER 2019

AUSTRALIAN NATIONAL UNIVERSITY, CANBERRA

[aups.org.au](http://aups.org.au)



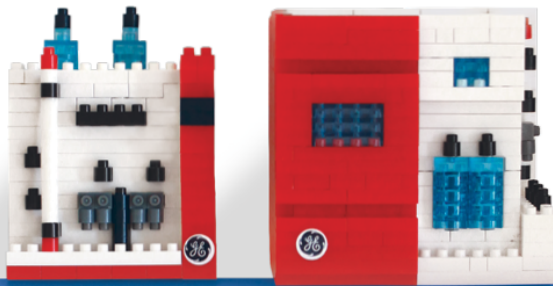
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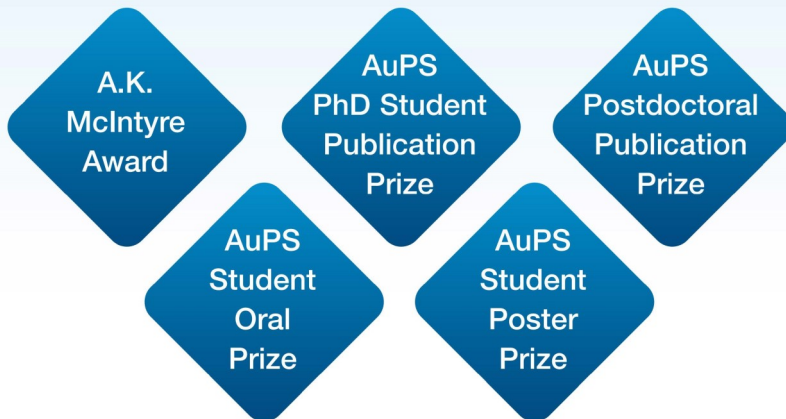
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# LOCAL ORGANISING COMMITTEE

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Chair: Prof Stefan Bröer (AuPS)  
Australian National University



Assoc Prof Nicole Beard (AuPS)  
University of Canberra



Assoc Prof Megan O'Mara (ASB).  
Australian National University



Assoc Prof Ben Corry (ASB)  
Australian National University



Dr Nick Cox (ASB)  
Australian National University



Dr Juliey Beckman (ASB)  
Australian National University

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Image: left: Canberra and city at sunset. credit: ©VisitCanberra.

Cover Images: ©VisitCanberra.

Lake Burley Griffin, Parliament House, ANU, National Museum of Australia, ANU, Canberra and City at sunset.



# WELCOME

On behalf of the **Australian Physiological Society** (AuPS), and **Australian Society for Biophysics** (ASB), we welcome you to the 2019 meeting, hosted by The Australian National University, located in the heart of Canberra (**Sunday December 1 to Wednesday December 4**).

The conference features:

- ◆ Twelve symposia across the physiological and biophysical sciences.
- ◆ Twelve international speakers.
- ◆ The physiological education symposium.
- ◆ Oral and poster free communication sessions with awards for student and post-doctoral presentations.
- ◆ AuPS Invited Lecturer by Prof Robyn Murphy (LaTrobe University)
- ◆ ASB Plenary Lecturer, with the prize winner To be announced during the conference.

The **welcome reception** on the Sunday night features Prof. Murphy's invited lecture, followed by a welcome reception of drinks and canape. **The annual conference dinner** on the Tuesday night will be held in the ballroom on the QT boutique hotel, located in the New Acton cultural precinct, and will be an event to be remembered. The **student and early career researcher mixer** on Monday evening promises to be a terrific social event.



*Stefan*

Prof Stefan Bröer

Research School of Biology  
ANU College of Science, Canberra

# CAMPUS INFORMATION

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The Acton Campus of ANU, is in the heart of Canberra approximately 25min walk from the city centre. The conference will take place at the *Australian Centre on China in the World* and the *Law Precinct*, both located off Fellows road <https://www.anu.edu.au/maps#>.

## TRANSPORT

By car

Parking for visitors to the University is available across the Acton campus in [Pay As You Go](#), [Pay & Display](#) and time limited zones.

On campus parking can be found on or around Fellows road is closest to the lecture theatres.

By taxi

Call Canberra Elite Taxi. Ph. 02 6126 1600. If travelling to campus, ask the driver to take you to either the Australian Centre on China in the World, 188 Fellows lane, ANU campus or the Law theatre precinct, Fellows road ANU campus. Taxi fares to the ANU campus are approximately \$27 from the airport and ~\$12 from the city centre. The closest taxi rank is at the ANU Biochemistry carpark, around 5 mins walk from the conference theatres

By bus

Information on the public transport network (including the MyWay ticketing system) can be found at [www.transport.act.gov.au](http://www.transport.act.gov.au).

Route 53 travels from the city interchange along the edge of the ANU campus. This bus runs every 20-30 mins during the weekday, and very hour in the weekend. Single use tickets can be purchased by cash onboard.

## ANU CAMPUS SECURITY

Campus security operates 24 hr: Ph. 02 6125 2249 (ext. 52 249)

# CONFERENCE INFORMATION



## EVENT ASSISTANCE

Should you require any assistance during the conference, please look for staff and student wearing ANU shirts and name badges. Alternatively, visit the registration desk, where staff will be available between 3pm-6pm Sunday and between 8am and 10am from Monday to Wednesday

## NAME BADGES

Please wear your name badge at all times, as it is your entry into all sessions and enables security to identify you as a conference delegate.

## IT SUPPORT

IT help for presenters: If you require assistance with IT at the conference, please approach staff at the registration desk or contact the IT Service Desk team (Mon-Fri: 9am to 5pm):

Email: [servicedesk@anu.edu.au](mailto:servicedesk@anu.edu.au)

Phone: 6125 4321 (ext 54 321)

## WIFI Access

WiFi is available to registrants and login details will be provided at registration. Alternatively you may access wifi via Eduroam.

## PRESENTATIONS

### Oral Presentations:

**All speakers must upload their presentations at least 30min before the start of their session. Files may be loaded between 8am—5pm each day.**

Please drag and drop your Powerpoint file into the named folder for your session on the PC desk top in the lecture theater where you are presenting. We recommend that you check any embedded videos or animated files at this time to ensure the file format is supported.

### Poster Presentations:

Posters should be mounted in their allocated space on Monday morning and remain on display for the duration of the conference.

**The poster session will be on Tuesday 1:30-3:30pm.**

Authors with odd numbered poster boards should be in attendance at their poster to answer questions for one hour, beginning at 1:30pm. Those with even numbered posters should be in attendance beginning at 2:30pm.

# CONFERENCE VENUE

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## **Registration and Welcome Reception**

Registration will take place in Lotus Hall, in the ANU Center on China in the World. The desk will be manned between 3-6 pm Sunday and 8-10 am Monday-Wednesday. The welcome reception will also be held in Lotus Hall, in the ANU Center on China in the World.

## **Lectures, Workshops, Symposia and Free Communications**

Sessions will be held across multiple venues, located centrally around the ANU Law Precinct:

- ANU Center on China in the World theatre
- Law Theatre 1
- Fellows Road Theatre 2
- Seminar room 1

## **Posters & Trade Displays**

Posters and trade displays will be in adjacent to Lotus Hall, in the ANU Center on China in the World.

## **Catering**

Lunch, morning tea and afternoon tea will be held in Lotus Hall, in the ANU Center on China in the World.



# FLOOR PLAN





# PASSIONATE ABOUT SCIENCE

Cardiovascular | Pharmacology | Physiology | Behaviour | Cancer Biology | Respiratory

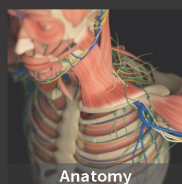
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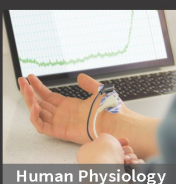
## Engage students in active learning



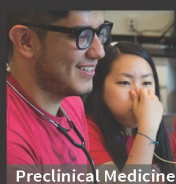
Nursing



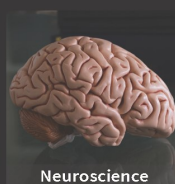
Anatomy



Human Physiology



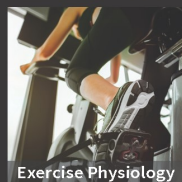
Preclinical Medicine



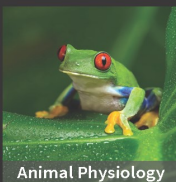
Neuroscience



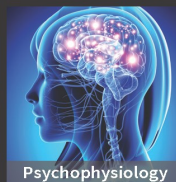
Pharmacology



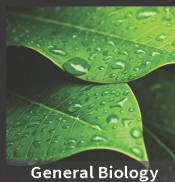
Exercise Physiology



Animal Physiology



Psychophysiology



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# 2019 CONFERENCE PROGRAMME

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<http://aps.org.au/Meetings/201912/programme.php>

# SUNDAY 1<sup>ST</sup> DECEMBER

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## WELCOME RECEPTION

The Welcome Reception features Prof Murphy's Invited Lecture in the ANU Centre on China in the World Lecture theatre. This lecture will be followed by a cocktail reception in the adjacent Lotus Hall.

- 3pm**      **Registration opens**  
Lotus Hall, ANU Center on China in the World
- 5:30pm**   **AuPS Invited Lecture: Prof Robyn Murphy**  
ANU Center on China in the World theatre
- 6:30pm**   **Welcome Reception**  
Lotus Hall, ANU Center on China in the World

# AUPS INVITED LECTURE

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**5PM, SUNDAY 1<sup>ST</sup> DECEMBER**



## AUPS INVITED LECTURE:

Physiological insights into skeletal muscle plasticity

**Prof Robyn Murphy**

La Trobe University

Robyn obtained her PhD at Deakin University, Melbourne in 2003. Her postdoctoral time was in the Department of Zoology, La Trobe University, where she held an NHMRC Peter Doherty Early Career Research Fellowship (2006-2009). In 2010, she began her academic career in Zoology and she progressed to Head of Department in Department of Biochemistry and Genetics, La Trobe University and full professor in 2018. Robyn served as the National Secretary of the Australian Physiological Society (2010-2013) and served on Council (2009-2017). She currently sits on multiple Executive Committees within her University as well as internationally. Robyn is passionate about mentoring in a variety of capacities. Robyn has published over 85 peer-reviewed research articles. The overall research interest of the Murphy lab is in the area of skeletal muscle in health and disease, from a muscle biochemistry perspective, where they aim to understand proteins important for metabolic and overall muscle health. The laboratory's particular expertise is in being able to identify proteins in very small sample sizes. This allows the examination of the movement of specific proteins following micro-dissection of fibres, providing quantitative assessment of the redistribution of proteins with given interventions. This research provides mechanistic insight into how changes in protein abundance and/or their movements that occur as a result of exercise, disease and ageing can affect the ability of muscle to produce force and thereby confer strength and stability, as well as maintain metabolic health. Such understandings will contribute to understanding how we can maintain strong muscles for a healthy life.

**Abstract 1P**

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## MONDAY 2<sup>ND</sup> DECEMBER

Stream 1 (AuPS) Law Theatre	Stream 2 (AuPS) China in the world	Stream 3 (ASB) Fellows Road Law Theatre 2
Symposium: Neurophysiology channels and transporters as a molecular mechanism of epilepsy Chair: Andrew Moorhouse	Free Communications: Cardiac and Skeletal Muscle Chairs: Rene Koopman and Andrew Betik	Symposium: Fluorescent Measurement of cellular function Chair: Andrea Yool
8:30 Fukuda A: Mutations and posttranslational modulations of the K <sup>+</sup> -Cl <sup>-</sup> cotransporter underlie seizures and epilepsy	8:30 Swiderski K: Phosphorylation of dystrophin S3059 protects against skeletal muscle wasting 8:45 Hagg A: Muscle fibre denervation and inhibited Bone Morphogenetic Protein signalling promote cancer associated muscle wasting	8:30 Durisic N: The Dynamic Synapse in Epilepsy: Effects of Heritable Human Mutations Revealed by Super-Resolution Microscopy
9:00 Koyama R: Synapse pruning by microglia during epileptogenesis	9:00 Nguyen JH: The cellular microenvironment supports muscle stem cell proliferation and regeneration 9:15 Hardee J.P: Metabolic and functional adaptations to low-frequency stimulation in dystrophic mice	9:00 Bong A: A recently identified ion channel in breast cancer
9:30 Linlin Ma: Novel venom-derived inhibitors of the human EAG channel, a putative antiepileptic drug target	9:30 Alves F: Iron chelator treatment ameliorates aspects of the dystrophic pathology in <i>mdx</i> mice 9:45 Silver J: The MiRNA Profile of Skeletal Muscle Mitochondria – NGS Challenges and Future Perspectives	9:30 Robinson S: Using animal venoms to identify new pain pathways
10:00 Absalom N: Why the drugs don't work: Lessons from GABAA receptor mutations in childhood epilepsies	10:00 Renton M.C: Essential role of protein kinase D in neonatal proliferating cardiomyocytes 10:15 Reichelt M: Deletion of ErbB4 in cardiomyocytes leads to rapid dilated cardiomyopathy in neonatal mice	10:00 Pei J.V: Analysis of nonselective cation channel activity in migrating cancer cells using photo-switchable ion sensor

10.30 – 11:00 Morning Tea: Lotus Hall



Stream 1 (AuPS) Law Theatre		Stream 2 (AuPS) China in the world		Stream 3 (ASB) Fellows Road Law Theatre 2	
Symposium: Cardiomyocyte Ca <sup>2+</sup> handling and myofilament modification Chair: Lea Delbridge		Free Communications: Metabolism Chair: Chris Shaw		Symposium: Biomedical Physics Chair: Evelynne Deplazes	
11.00	Louch W.E: Cardiomyocyte dyadic plasticity in heart failure	11.00	Roberts-Thomson K: Impaired Skeletal Muscle Macro- and Micro-vascular Blood Flow in Healthy People with a Family History of Type 2 Diabetes	11:00	Küchel P: Zero-trans C <sub>s</sub> + transport in human erythrocytes: dissolution hyperpolarized <sup>13</sup> C <sub>s</sub> + NMR spectroscopy
		11:15	Tracey A: Can undercarboxylated osteocalcin be a potential therapeutic target for blood vessel disease?	22P	
11.30	Mellor K: Intracellular protein glycation - a contributing factor in diabetic cardiomyopathy?	11.30	Mikovic J: The effect of maternal high fat diet on offspring post-natal myogenesis	23P	
		11:45	Martin A: The gut microbiome regulates host glucose homeostasis via peripheral serotonin	24P	31P
12.00	Jones P: Regulation of intracellular Ca <sup>2+</sup> release in the heart	12.00	Morales-Scholz: Human muscle fibre-type specific autophagy responses to a mixed meal tolerance test	25P	
		12:15	Rose A: Endocrine-metabolism interactions link skeletal muscle atrophy in diabetes.	26P	32P
12.30	Ritchie R: O-GlcNAc modifications in diabetic cardiomyopathy	12.30	Watt M: Phosphorylation of PLIN5 on Ser155 by protein kinase A controls triglyceride metabolism	27P	
		12:45	Cuffe J: Selenium deficiency, thyroid dysfunction and Gestational Diabetes Mellitus	28P	33P
				29P	34P
13:00-14:00		Lunch: Lotus Hall			

# SAVANT THAKUR ECR WORKSHOP

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**MONDAY 2<sup>ND</sup> DECEMBER**

**Time: 5:30pm**

**Venue: Fellows Road Theatre 2**

The 2019 '**Savant Thakur ECR Workshop:** ' will explore some professional and personal adversities that we must overcome in the physiology research field. As students and ECRs, we often have high expectations of what success in the field requires - including high impact papers, grants, and competitive post-docs. In this workshop, we will spend some time discussing how to manage expectations and some strategies to approach our career planning.

The ECR workshop is intended for junior researchers (honours, PhD and up to 10 years post-PhD).

For more information contact the AuPS student representative [Macsue Jacques](mailto:macsue.jacques@live.vu.edu.au) ([macsue.jacques@live.vu.edu.au](mailto:macsue.jacques@live.vu.edu.au))



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*The AuPS council have named the event the Savant Thakur ECR Workshop to honour the memory of Savant Singh Thakur (10/12/1991—16/06/2019), an active student member of the AuPS Society. Savant was a brilliant, dedicated and high-achieving student who overcame considerable adversity to become an inspirational scientist, undertaking research to find a cure for DMD and be a help to so many others. While he had faced challenges over the years to treat his condition, Duchenne Muscular Dystrophy, Savant had an amazing impact on all he met.*

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# STUDENT AND ECR MIXER

## MONDAY 2<sup>ND</sup> DECEMBER

**Time:** 6:30 - 9:30pm

**Venue:** The Fellows Bar and Cafe  
1 Balmain Crescent

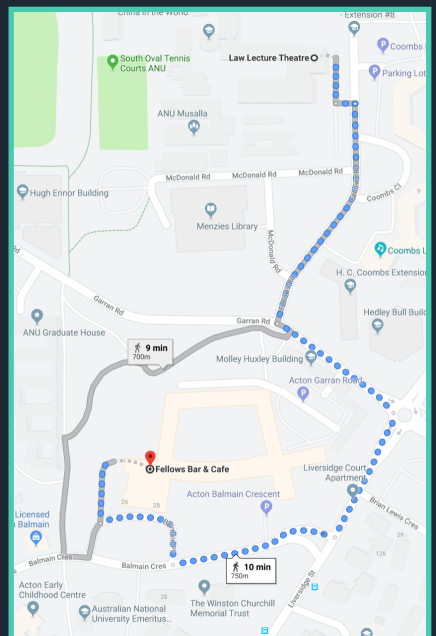
**Dress:** Casual



The student and ECR mixer is on Monday evening following the *Savant Thakur ECR workshop*. Organizers Giselle Allsopp and Macsue Jacques have chosen a great venue for the event - [The Fellows Bar and Cafe](#), conveniently located close to the conference venue.

The mixer is a great opportunity for students and ECRs to have fun and participate in some valuable networking!

(Please meet the organisers at the ECR workshop should you wish to walk to the venue as a group) Link to [google maps](#)



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Stream 1 (AuPS) Law Theatre	Stream 2 (AuPS) China in the world	Stream 3 (ASB) Fellows Road Law Theatre 2
<p>Symposium: Unravelling the mysteries of mitochondria in health and disease Sponsored by Physiological Society Chair: Livia Hool</p> 	<p>Free Communication: Channels and Transporters Chair: Stephen Fairweather</p>	<p>Symposium: Alternatives approaches to the use of animals in physiology and biophysics Sponsored by MAWA Chair: Boris Martinac and Stefan Broer</p> 
<p>14:00 Sheu S.S.: The implications of sarcoplasmic reticulum-mitochondrial calcium signaling in cardiac function</p>	<p>14:00 Lacroix J.: Optical Tracking of Piezo1 Conformational Changes 14:15 Gauthier-Coles G.: Identifying Novel Small Molecule Inhibitors of the Neutral Amino Acid Transporter SLC38A2 - A Driver of Amino Acid Homeostasis in Cancer Cells</p>	<p>14:00 Perozo E.: TBC 50P</p>
<p>14:30 Viola H.M.: Regulation of cardiac metabolic activity: the role of extracellular matrix stiffness</p>	<p>14:30 Lau C.: Working toward better understanding of the gating mechanism of the hERG potassium channel 14:45 Keramidas A.: Mechanisms of drug sensitivity at glutamate-gated chloride channel receptors</p>	<p>14:30 Baker M.: Resurrecting the ancient flagellar motor 51P</p>
<p>15:00 Philp A.: The influence of aerobic exercise on mitochondrial quality control</p>	<p>15:00 Windley M.: Assessing a high throughput implementation of protocols to measure kinetics and potency of proarrhythmic drug binding to hERG channels 15:15 Ashna A.: Effects of hydantoin derivatives on sheep cardiac ryanodine receptor (RYR2)</p>	<p>15:00 Finol-Urdaneta R.: Assessing off-target effects of approved pharmaceuticals on novel antimicrobial targets. 52P</p>
<p>15:30 Filipovska A.: The role of mitochondrial biogenesis in cardiomyopathy</p>	<p>15:30 Dulhunty A.F.: Preliminary phenotype characterization of the RyR1 P3528S central core disease mouse</p>	<p>15:30 Wilson K.A.: Computational Modelling of Lipid Inhibitor Binding to the Neurotransmitter Transporter GlyT2 154P</p>
<p>16:15-17:15</p>	<p>16:00- 16:15 Afternoon Tea ASB Bob Robertson Plenary Lecture (Award and speaker to be announced on the day).</p>	
<p>17:30-18:30</p>	<p>17:30 ASB AGM</p>	<p>17:30 'Savant Thakur' ECR Workshop Fellows Road Theatre 2</p>
<p>18:30-21:30</p>	<p>ECR Mixer: Fellow Bar &amp; Cafe</p>	



## TUESDAY 3<sup>RD</sup> DECEMBER

Stream 1 (AUP5) Law Theatre		Stream 2 (AUP5) China in the world		Stream 3 (ASB) Fellows Road Law Theatre 2	
Symposium: Sex-differences in metabolism: novel insights on mechanisms Chair: Adam Rose		Symposium: Ion Channels in different tissues Chair: Brad Launikonis		Symposium: Membrane Protein Biophysics Sponsored by JGP Chair: Toby Allen	
8:30	Reue K: Genetic control of sex differences in metabolic physiology	8:30	Domeier T: Transient Receptor Potential Vanilloid 4 in cardiac ischemia-reperfusion and preload elevation	8:30	Nimigean C: Mechanism of Ca2+-gating in potassium channels
9:10	Kallies A: Sex-dependent differentiation of regulatory T cells in the visceral adipose tissue	9:00	Davis F: Multiscale activity imaging in the mammary gland reveals how oxytocin enables lactation	9:00	Scheuring S: Structural response of the piezo channel upon application of force
9:50	Walton K: Loss of inhibin function results in sex-specific disruptions to reproductive and metabolic function	9:30	Cox C: The mechanically-gated ion channel Piezo1 acts as a mechanosensor in the endocardial endothelium: Implications for health and disease	9:30	Galli A: A Network of Phosphatidylinositol (4,5)-bisphosphate (PIP2) Binding Sites on the Dopamine Transporter Regulate Amphetamine Behaviors in Drosophila Melanogaster
10:10	Landen S: Sex-Specific Epigenetic Adaptations to Endurance Exercise	10:00	Launikonis B: A single session of sprint-interval exercise changes plasma membrane-sarcoplasmic reticulum-mitochondrial Ca2+ handling in human muscle	10:00	Nishizaka T: Membrane-embedded molecular motors to propel microorganisms

10:30-11:00 Morning Tea: Lotus Hall

# A SIMPLIFIED TRANSFER PROCESS

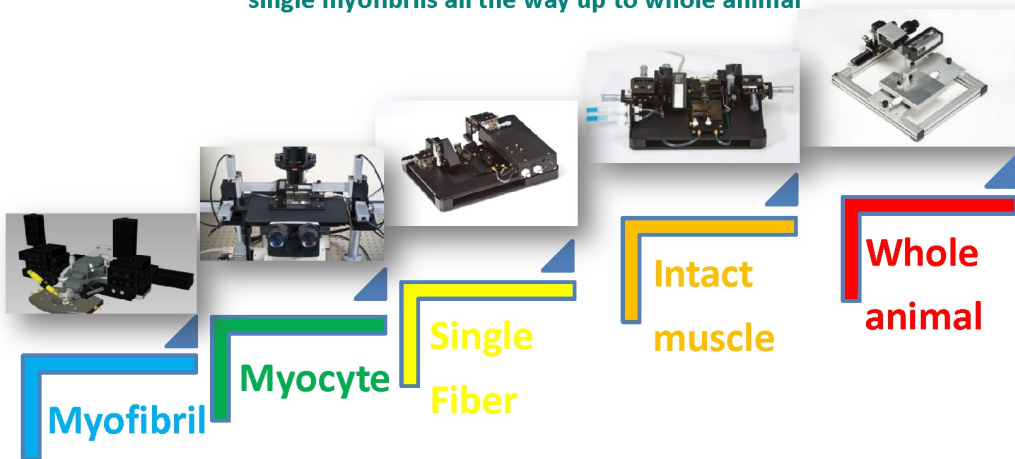
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<p>Stream 1 (AuPS) Law Theatre</p>	<p>Stream 2 (AuPS) China in the world</p>	<p>Stream 3 (ASB) Fellows Road Law Theatre 2</p>
<p>Symposium: Environmental and epigenetic influences on cardiovascular physiology Chair: Jim Bell</p>	<p>Symposium: Model systems to advance human physiology research Chair: Andrew Philip</p>	<p>Symposium: Young Biophysicists Chair: Adam Hill</p>
<p>11:00 Morrison J: Small babies, Big hearts: What we know and what we can do about it? 66P</p>	<p>11:00 Mills R: Engineering micro muscles – adding another dimension to skeletal muscle research 70P</p>	<p>11:00 Garcia A: Measurement of apparent binding affinities of calcium to phospholipid bilayers using tethered bilayer lipid membranes 74P</p>
<p>11:30 Fisher J: Cardiovascular autonomic pathophysiology: mechanisms of environmental maladaptation 67P</p>	<p>11:30 Smith K: Identification of novel genes regulating cardiac physiology using genetic screening in zebrafish 71P</p>	<p>11:20 Su Q: Biophysical Nanotools for Membrane Dynamics during autolysosome tubulation, mitochondrial network formation and human platelet spreading 75P</p>
<p>12:00 Daniels L: Metabolic consequences of cardiac fructose metabolism 68P</p>	<p>12:00 Etheridge T: Sending worms into space to understand human muscle wasting disorders 72P</p>	<p>11:40 Kachooei E: The Ca2+ and phosphorylated triggered movement of the cardiac muscle Troponin switch as tracked by site directed spin labelling 76P</p>
<p>12:30 Porrello E: The accessible chromatin landscape of human cardiomyocyte development 69P</p>	<p>12:30 Ruparelia A: Killifish as a model to study the mechanistic basis of sarcopenia 73P</p>	<p>12:00 Nourmohammadi S: Systematic dissection of the molecular actions of compounds from traditional medicinal mixtures on the migration, invasion and apoptosis of brain, bowel and breast cancer cells 77P</p>
<p>13:00-13:30 Lunch: Lotus Hall</p>		<p>12:20 Hartmann L: The membrane insertion properties of the pH-switchable GALA peptide 78P</p> <p>12:40 Wang: Using molecular dynamics simulations to correlate structural changes with the efficiency of dendronised polymers for plasmid DNA delivery 79P</p>

80P Vennitti J: Modelling Amino Acid Homeostasis in Cancerous Cells

81P Tae H.S:  $\alpha$ -Conotoxin dimerization enhances potency at the human  $\alpha 9\alpha 10$  nicotinic acetylcholine receptor

82P So C.L: MDA-MB-231 breast cancer cells cultured on a higher matrix stiffness show differential calcium signalling.

83P Demiss A.L: Towards understanding the relationship between phosphor- and redox-modification of the intracellular calcium release channel (ryanodine receptor)

84P Chow P: Furan-based compounds selectively block the Aquaporin-1 ion channel conductance and slow cancer cell migration and invasion

85P Bye L.J: Nicotinic acetylcholine receptor expression and function in immune cells: The role of  $\alpha$ -conotoxins as neuroimmunomodulators

86P Bony A.R: Modulation of native and recombinant GIRK1/2 channels by analgesic  $\alpha$ -conotoxins

87P Amro Z.A: Blocking Bacterial Water Channels to Prevent Growth of *Staphylococcus aureus* Small Colony Variants

88P Henderson S: Cell-free measurements of recombinant AQP1 non-selective cation channel activity

89P Singh D.P: Effects of obesity on ryanodine receptor Ca2+ handling in rat skeletal muscle.

90P Seng C.L: Methods for examining mitochondrial Ca2+ and inorganic phosphate buffering in skeletal muscle

91P Pearce L: Chronic Ca2+ leak in ryanodine receptor variants change plasma membrane Ca2+ handling properties

92P Meizoso-Huesca A: Core muscles have leaky RyRs compared to distal muscles.

93P Trewin A: Expression of the PGC-1 $\alpha$ -interacting long non-coding RNA *Tug1* in response to exercise

94P Thompson B.K: The use of curcumin to improve functional repair of skeletal muscle post-*ischaemic injury*

95P Dharmapriani D: Renewal theory provides a universal quantitative framework to characterise the continuous regeneration of phase singularities in cardiac fibrillation

96P Kirjaev L: Isolated fast-twitch extensor *digitorum longus* muscles from old mdx dystrophic mice show little force recovery 120 minutes after eccentric damage

97P Perry B.D: A study of the effects of Minocycline treatment on morphology and contractile properties of isolated slow- and fast-twitch mouse muscles and protein synthesis in C2C12 myotubes

98P Gray C: Dynamic Relocation of Akt in Response to Insulin

99P Rajaraman G: Effective teaching strategies and interactive tools for student engagement in science block mode

100P Gouillon C: Using an online workshop tool to enhance student peer assessment of short answer questions in an introductory neuroscience course

101P Frankenberg N: A different approach to think-pair-share, think-group-challenge.

102P Campbell C: Increasing student engagement in Physiology practical classes with video: a pilot study

103P Marden N and Ullman L: Supporting Introductory Physiology practical classes with pre- and post-laboratory online activities: impact on students' learning experience and outcomes

104P Dymke A: Free energy simulations of general anaesthetic binding to a pentameric ligand-gated channel.

105P Lin Y: Using computational chemistry to understand how membrane composition affects neurotransmitter transporters

106P Lankage U.M: Development of a tethered bilayer lipid membrane (tBLM) pancreatic lipase sensor

107P Flood E: Exploring *HERG* potassium channel inactivation using molecular dynamics of *cryo* EM structures

108P Judd M: EDNMR as a new EPR distance for short-range distance measurements in biomolecules

109P Purchase R: New spectroscopic perspectives on photosystem II reaction centres

164P Finol-Urdaneta, Rk: Functional cell phenotyping, drug screening platform development, and identification of an ASC1a-active therapeutic lead

165P: Wright, C: A modern approach to teaching anatomy and physiology to a large diverse first year cohort.

166P: Goodear, S: Hypoxia does not augment immunosuppression post-resistance exercise

Stream 1 (AuPS) Law Theatre		Stream 2 (AuPS) China in the world		Stream 3 (ASB) Fellows Road Law Theatre 2			
Free communication: Across the membrane		Free communication: Neuroscience:		Symposium: Membrane Protein Biophysics (2)			
15:30	Keating D: The human gut is a source of extra-pancreatic glucagon Chair: Megan O'Mara	110P	15:30	French C: The Biophysics of Cognition – Effects of Potassium Channel (Kv) Modulators on Cognition-related Brain Oscillations in Mice Chair: David Adams	116P	15:30	Savitsky A: The Magic of Trehalose: Coupling between matrix properties and protein function Chair: Amanda Buvan
15:45	Javed K: Mice Lacking the Intestinal and Renal Neutral Amino Acid Transporter SLC6A19 Demonstrate the Relationship between Dietary Protein Intake and Amino Acid Malabsorption	111P	15:45	Grounds M: Translational consequences of neurodegenerative changes in dystrophic nerves of mdx rodent models for Duchenne Muscular Dystrophy	117P		
16:00	Shah N: Can humanised bacterial LeuT be used to study the pharmacology of human BOAT1 (SLC6A19)?	112P	16:00	Argarini R: Introducing Optical Coherence Tomography for Structural and Physiological Assessment of the Human Cutaneous Microvasculature: Impact of Physiological stimulation	118P	16:00	Deplazes E: Membrane-disruption is necessary but not sufficient for the anti-cancer activity of the spider peptide <a href="#">Gomesin</a>
16:15	Sun E: A gut-intrinsic melanocortin signalling complex regulates L-cell secretion in humans	113P	16:15	Housley G.D: Peripherin knockout mouse lacks olivocochlear efferent suppression of the outer hair cell-based control of the cochlear amplifier except when driven by electrical stimulation - supporting type I spiral ganglion neuron sensory drive	119P		
16:30	Fairweather S.J: Uncovering membrane transport in biological milieu: combining GC-MS metabolomics with classic single cell physiology to discover complex amino acid transport and its contribution to mTORC1 signalling	114P	16:30	McArthur J.R: Potential molecular mechanism of opioid synergy in $\mu$ -theraphotoxin-Pn3a-induced analgesia	120P	16:30	Beilby M.J: Action potential evolution: new perspectives
16:45	Yadav A: Identification of Novel inhibitors for BOAT1 (SLC6a19): A potential target for treating diabetes and phenylketonuria	115P	16:45	Heyward P.M: Lithium and action potentials in the brain.	121P		
			17:00			17:00	MacDermott-Opeskin H: Determining the mechanism of a novel class of mitochondrial uncoupler (20mins)
19:00	Conference Dinner: QT Canberra						



# CONFERENCE DINNER

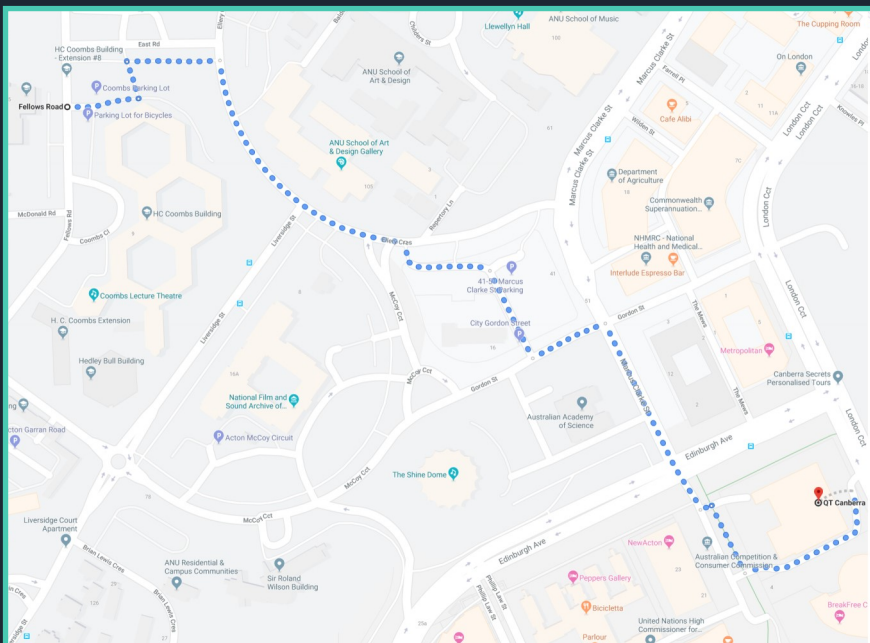
TUESDAY 3<sup>RD</sup> DECEMBER 2019

**Time:** 7pm  
**Venue:** QT Canberra Ballroom  
1 London Circuit, Canberra  
**Dress:** Lounge Suit



The annual conference dinner on the Tuesday night will be held in the ballroom on the QT boutique hotel. Located in the New Acton cultural precinct, this will be an event to be remembered. The evening will begin with a glass of sparkling at 7pm, to be followed by a three course sit down dinner (cost is included in your registration).

Delegates are asked to make their own way to the QT ballroom. The venue is an easy 1km (10-15 min) walk from the conference theatres (link to [google maps](#)).



## WEDNESDAY 4<sup>TH</sup> DECEMBER

Stream 1 (AuPS) Law Theatre		Stream 2 (AuPS) Law Link Theatre, Law School Building (#7)		Stream 3 (ASB) Fellows Road Law Theatre 2	
Symposium: Using Next-Generation Technologies to unlock Novel Cellular Physiology Chair: Kevin Watt		Education Symposium: 21st Innovations in Physiology in Practical Classes Chair: Julia Choate		Symposium: Molecular machines/processes Chair: Charles Cox	
9:00	Parker B: Proteome-wide Systems Genetics Analysis of Mammalian Metabolism	9:00	126P Kibedi J: Development of tutors' dialogic and feedback skills that promote students' scientific writing	9:00	134P Clarke R: Membrane-interaction of P-type ATPase N-termini: A possible physiological role of animal cell membrane asymmetry
		9:15	130P Kuit T: eNotebooks in Laboratory Teaching: Developing Students Employability Skills using a Students as Partners Approach		
		9:30	131P Day M: Use of a cloud-based interactive learning tool in Physiology practicals and beyond	9:30	135P Coster A.C.F: Right Place, Right Time – Signalling Delays and Translocation in the Insulin Signalling System
9:40	Simpson K: Making novel discoveries using high throughput technologies	9:45	132P Sevigny C: The Virtual Reality Human Heart: Development, scalability, and student engagement with a novel VR learning tool.		
		10:00	133P Beckett L: Reattaching the cart to the horse: The benefits of a gradual progression from structured to guided inquiry for the development of research skills in physiology teaching	10:00	136P Heitmann S: Cardiac fibrillation as the failure of repolarisation
10:20	Judson R: Using <a href="#">iPS</a> technologies for muscle disease modelling and cell therapy			10:30	137P Hossain K.R: Polarity of the ATP Binding Site of P-Type ATPases

11:00 – 11:30 Morning Tea: Lotus Hall

Stream 1 (AuPS) Law Theatre		Stream 2 (AuPS) Law Link Theatre, Law School Building (#7)		Stream 3 (ASB) Fellows Road Law Theatre 2	
Free Communication: Exercise Physiology Chairs: Danielle Hiam and Magsue Jacques		Free Communication: Innovations in Physiology Education Chair: Julia Choate		Free Communication: Channels and Transporters Chair: Emilee Flood	
11:30	Jacques M: Measuring true physiological responses to exercise using a repeated and longer exercise intervention	138P	Pinar A: Does Attendance at Practicals and Workshops Predict Exam Performance in a Second-Year Physiology Subject?	146P	163P
11:45	Hiam D: The association between aerobic capacity and telomere length in human skeletal muscle and leukocytes across the lifespan	139P	Parkinson A.L: "Honey I shrunk the students!" Teaching inside a cell, inside a CAVE	147P	
12:00	Taylor R.A: Impact of exercise training on prostate cancer metabolism and progression in <u>Pten</u> <sup>-/-</sup> mice	140P	Cameron M.S: Integrating theoretical and practical endocrine physiology to enhance the student learning experience.	148P	155P
12:15	Botella J: Exercise- and training-induced skeletal muscle mitochondrial remodelling in healthy males	141P	Klein R: Computer Based Learning in a new 'Block model' of teaching Anatomy	149P	
12:30	Alexander S: Are Baseline Testosterone Concentrations Predictive of Changes to Skeletal Muscle Strength or Hypertrophy in Response to Resistance Training in Untrained Females?	142P	Vasudeva S: Challenges and opportunities in blending physiology courses	150P	156P
12:45	Pascoe A: Chronic resistance exercise induces changes in mitochondrial content and function in the absence of muscle mass hypertrophy in ageing mice	143P	Klein R: Effective flipped-blended design for facilitating self-directed learning in first year Anatomy and Physiology Block units	151P	
13:00	Allsopp G: The effect of <u>normobaric</u> hypoxia on strength adaptations to resistance training in older adults.	144P	Lewis L: A multidisciplinary Students as Partners project designed to educate the public on the pathophysiology of a disease: the good, the bad and the ugly.	152P	41P
13:15	Betick A. C: <u>Skeletal Muscle</u> Microvascular Dysfunction Prevails in Overweight Individuals despite Being Physically Active.	145P	Thomas C.J: Engaging students with critical analysis of literature.	153P	158P
13:30 - 14:00 Lunch: Lotus Hall					

Stream 2 (AuPS) Law Link Theatre, Law School Building (#7)													
14:00 – 15:00	<p><b>Education Free Communication:</b>  <b>Physiology education across the country</b>            Chair: Pushpa Sinnayah</p> <table border="1"> <tr> <td>14:00</td> <td>Tangalakis K: Mapping the Core Concepts of Physiology</td> <td>159P</td> </tr> <tr> <td>14:15</td> <td>Choate J: What are the roles of laboratory classes in biomedical sciences education?</td> <td>160P</td> </tr> <tr> <td>14:50</td> <td>Colthorpe K: Biomedical Science Students' Intended Graduate Destinations</td> <td>161P</td> </tr> <tr> <td>14:45</td> <td>Ainscough L: Making Biomedical Science relevant to Clinical Practice: A Student-Staff Partnership Case Study</td> <td>162P</td> </tr> </table>	14:00	Tangalakis K: Mapping the Core Concepts of Physiology	159P	14:15	Choate J: What are the roles of laboratory classes in biomedical sciences education?	160P	14:50	Colthorpe K: Biomedical Science Students' Intended Graduate Destinations	161P	14:45	Ainscough L: Making Biomedical Science relevant to Clinical Practice: A Student-Staff Partnership Case Study	162P
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14:45	Ainscough L: Making Biomedical Science relevant to Clinical Practice: A Student-Staff Partnership Case Study	162P											
	AuPS AGM (Seminar Room 1)												
15:00 – 16:30	<p>Education Workshop            Law Link Theatre, Law School Building (#7)</p>												



# AUPS EDUCATION WORKSHOP

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WEDNESDAY 4<sup>TH</sup> DECEMBER

**Time:** 3-4:30pm

**Venue:** Law Link Theatre, Law School Building (#7)

## WHAT ARE THE GENERIC AND TECHNICAL SKILLS WE EXPECT OUR PHYSIOLOGY STUDENTS TO DEVELOP DURING THEIR DEGREE PROGRAM?

The Physiology Majors Interest Group (PMIG) of the American Physiological Society recently collated generic and technical skills they thought should be developed by students undertaking a Physiology major in their degree-program.

At the AuPS Education Workshop this year, we will use an on-line survey tool to provide anonymous feedback on these 'Physiology' skills. Following evaluation of our feedback, we will develop multiple choice questions to assess some of the specific physiology technical skills.

### Facilitators:

Julia Choate (Monash University) & Juliey Beckman (ANU)

For further information contact Julia Choate:  
[julia.choate@monash.edu](mailto:julia.choate@monash.edu)

## NOTES



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