

# AuPS/ASB 2019 SCIENTIFIC MEETING

---



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)



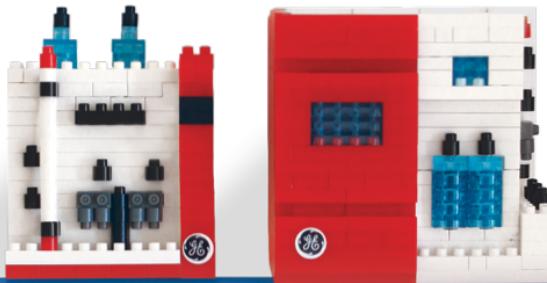
@AuPhysiolSoc





# A Piece of Science

Blocks build science, together they reveal it.



**Meet the world's smallest ÄKTA™**

**Register with us at our booth to collect your own**

**Or register on-line to have one sent to you...**

<https://landing1.gehealthcare.com/lifesciencesforme-en.html>

**For more information on the real ÄKTA systems,**

Visit : [bit.ly/AKTA-en](https://bit.ly/AKTA-en)



# SDR

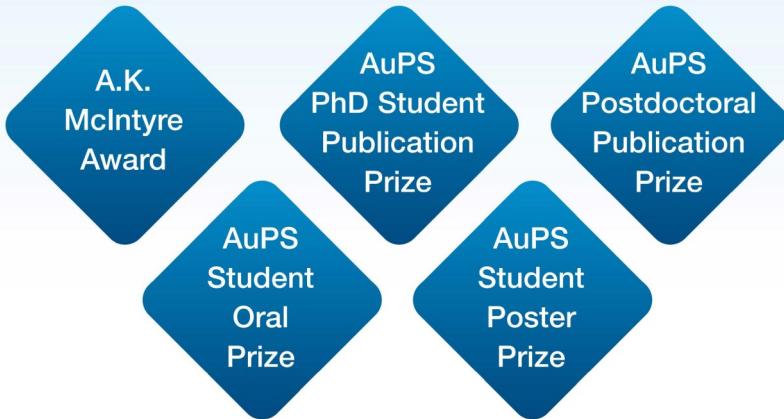
## SCIENTIFIC

### EQUIPMENT • SUPPORT • RESULTS

Established for more than 30 years, SDR Scientific provides quality hardware, software and consumables for life science researchers across Australia and New Zealand.

With the backing of a depth of reputable suppliers, we also provide installation, training, equipment service and technical support. At SDR Scientific, our objective is to make your life easier: helping you get the results you need, to achieve the success you deserve.

Proud Supporters of AuPS and sponsors of the:



Quality equipment & consumables for life science researchers

206 / 354 Eastern Valley Way, Chatswood NSW 2067   t 02 9882 2882   e [info@sdr.com.au](mailto:info@sdr.com.au)

**WWW.SDR.COM.AU**

# LOCAL ORGANISING COMMITTEE

---



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

---

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

---



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

---



## 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

Visit our exhibit to see  
the latest from CWE,  
DMT, Indus Instruments,  
Oxford Optronix,  
Transonic,  
and Ugo Basile.

APAC  
SCIENTIFIC

## Engage students in active learning



Lt is an online learning platform with ready-to-use content for life science courses.

Try Lt for FREE  
[adi.to/lt](http://adi.to/lt)



2019

# CONFERENCE PROGRAMME

---



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

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

---



---

## 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

---

**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

---

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+-Cl- cotransporter underlie seizures and epilepsy	8:30 Swiderski K: Phosphorylation of dystrophin S3059 protects against skeletal muscle wasting	8:30 Durisic N: The Dynamic Synapse in Epilepsy: Effects of Heritable Human Mutations Revealed by Super-Resolution Microscopy	14P	
9:00	Koyama R: Synapse pruning by microglia during epileptogenesis	8:45 Hägg A: Muscle fibre denervation and inhibited Bone Morphogenetic Protein signalling promote cancer associated muscle wasting	9:00 Bong A: A recently identified ion channel in breast cancer	15P	
9:30	Linlin Ma: Novel venom-derived inhibitors of the human EAG channel, a putative antiepileptic drug target	9:00 Nguyen JH: The cellular microenvironment supports muscle stem cell proliferation and regeneration	9:15 Hardie J.P: Metabolic and functional adaptations to low-frequency stimulation in dystrophic mice	9P	
10:00	Absalom N: Why the drugs don't work: Lessons from GABA receptor mutations in childhood epilepsies	9:30 Alves F: Iron chelator treatment ameliorates aspects of the dystrophic pathology in <i>mdx</i> mice	10P	9:30 Robinson S: Using animal venoms to identify new pain pathways	16P
		9:45 Silver J: The MiRNA Profile of Skeletal Muscle Mitochondria – NGS Challenges and Future Perspectives	11P		
		10:00 Renton M.C: Essential role of protein kinase D in neonatal proliferating cardiomyocytes	12P	10:00 Pei J.V: Analysis of nonselective cation channel activity in migrating cancer cells using photo-switchable ion sensor	17P
		10:15 Reichelt M: Deletion of Erbb4 in cardiomyocytes leads to rapid dilated cardiomyopathy in neonatal mice	13P		
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 myofibrillar modification Chair: Lea Delbridge	Louch W.E: Cardiomyocyte dyadic plasticity in heart failure	18P	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	22P	11.00 Kuchel P: Zero-trans Cs+ transport in human erythrocytes: dissolution hyperpolarized <sup>133</sup> Cs <sup>+</sup> NMR spectroscopy
	11.15 Tracey A: Can undercarboxylated osteocalcin be a potential therapeutic target for blood vessel disease?		11.15 Mikovic J: The effect of maternal high fat diet on offspring post-natal myogenesis	23P	11.15 Buyan A: How do specific lipids affect your ability to sense mechanical forces via Piezo1?
	11.30 Mellor K: Intracellular protein glycation - a contributing factor in diabetic cardiomyopathy?	19P	11.30 Martin A: The gut microbiome regulates host glucose homeostasis via peripheral serotonin	24P	11.30 Cranfield C.G: Tethered Bilayer Lipid Membrane Phospholipase Sensor Arrays
	12.00 Jones P: Regulation of intracellular Ca <sup>2+</sup> release in the heart	20P	12.00 Morales-Scholz: Human muscle fibre-type specific autophagy responses to a mixed meal tolerance test	26P	12.00 Cranfield C.G: Tethered Bilayer Lipid Membrane Phospholipase Sensor Arrays
	12.15 Rose A: Endocrine-metabolism interactions link skeletal muscle atrophy in diabetes.		12.15 Watt M: Phosphorylation of PLIN5 on Ser155 by protein kinase A controls triglyceride metabolism	27P	12.15 Morkel C: Direct observation of myosin cross-bridge heads as they hydrolyze ATP in cardiomyocytes from healthy donors and in end-stage human heart failure
	12.30 Ritchie R: O-GlcNAc modifications in diabetic cardiomyopathy	21P	12.30 Cuffe J: Selenium deficiency, thyroid dysfunction and Gestational Diabetes Mellitus	29P	12.30 Craig R: Pilot study using weak static magnetic fields after skin excisions
Symposium: Biomedical Physics Chair: Evelyn Delplacez					
13:00-14:00      Lunch: Lotus Hall					

13:00-14:00 Lunch: Lotus Hall

# SAVANT THAKUR ECR WORKSHOP

---

**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))



*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.*

# STUDENT AND ECR MIXER

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

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

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

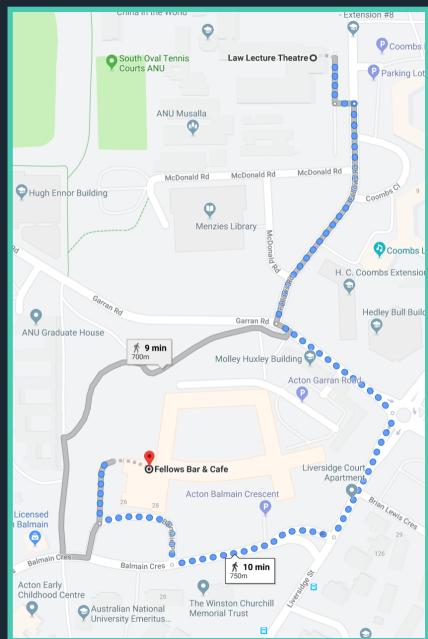
**Dress:** Casual



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](#)



Submit your research

# The Journal of Physiology

## Here's why you should publish in *The Journal of Physiology*...

*The Journal of Physiology* publishes important advances in our knowledge of physiology that increase our understanding of how our bodies function in health and disease.

- **Free to publish** – no submission fees
- **No page or figure limits** – no restrictions on page length or the number of tables and figures
- **Expert and comprehensive review** – two reviewer reports and first decision in less than five weeks
- **Rapid publication** – articles published online within days of acceptance
- **Open Access option available** – compliant with all major funders' policies
- **Excellent visibility** – the most highly cited Physiology journal >52,000 total cites in 2019
- **Be amongst the most trusted research** – cited half-life of over 10 years – the highest in Physiology
- **Prestigious history** – authors include over 40 Nobel Prize winners
- **Outstanding author services** – pre-submission queries welcome
- **Prior publication on preprint servers allowed**

**2018 Two-year Impact Factor: 4.950**

Submit your research: [jp.physoc.org](http://jp.physoc.org)

The Journal of  
Physiology



[jp.physoc.org](http://jp.physoc.org)

[jphysiol@physoc.org](mailto:jphysiol@physoc.org)

@JPhysiol

/journalofphysiology

[bit.ly/JPhysiolLinkedIn](https://bit.ly/JPhysiolLinkedIn)

Stream 1 (AURS) Law Theatre		Stream 2 (AURS) China in the world		Stream 3 (ASB) Fellows Road Law Theatre 2	
Symposium: Unravelling the mysteries of mitochondria in health and disease Sponsored by Physiological Society Chair: Livia Hool	The Physiological Society	Free Communication: Channels and Transporters Chair: Stephen Fairweather	Symposium: Alternatives approaches to the use of animals in physiology and biophysics Sponsored by MAWA Chair: Boris Martinac and Stefan Broer	MAWA MEDICAL ADVANCES WITHOUT ANIMALS	
14:00 Sheu S.S: The implications of sarcoplasmic reticulum-mitochondrial calcium signaling in cardiac function	35P	14:00 Lacroix J.: Optical Tracking of Piezo 1 Gauthier-Coles G.: Identifying Novel Small Molecule Inhibitors of the Neutral Amino Acid Transporter SLC38A2 - A Driver of Amino Acid Homeostasis in Cancer Cells	39P 40P	14:00 Perozo E.: TBC	50P
14:30 Viola H.M: Regulation of cardiac metabolic activity: the role of extracellular matrix stiffness	36P	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	157P 42P	14:30 Baker M.: Resurrecting the ancient flagellar motor	51P
15:00 Philip A: The influence of aerobic exercise on mitochondrial quality control	37P	15:00 Windley M.: Assessing a high throughput implementation of protocols to measure kinetics and potency of proarrhythmic drug binding to hERG channels	43P	15:00 Finol-Urdaneta R.: Assessing off-target effects of approved pharmaceuticals on novel antimicrobial targets.	52P
15:30 Filipovska A: The role of mitochondrial biogenesis in cardiomyopathy	38P	15:15 Ashna A.: Effects of hydantoin derivatives on sheep cardiac ryanodine receptor (RyR2) 15:30 Dulhunty A.F.: Preliminary phenotype characterization of the RyR1 P352S85 central core disease mouse	44P 45P	15:30 Wilson K.A.: Computational Modelling of Lipid Inhibitor Binding to the Neurotransmitter Transporter GlyT2	154P
16:15-17:15		16:15 ASB Bob Robertson Plenary Lecture (Award and speaker to be announced on the day).		16:00- 16:15 Afternoon Tea	
17:30-18:30		17:30 ASB AGM		17:30 'Savant Thakur' ECR Workshop Fellows Road Theatre 2	
18:30-21:30		18:30 ECR Mixer: Fellow Bar & Cafe			

TUESDAY 3 <sup>RD</sup> DECEMBER					
Stream 1 (AusPS) Law Theatre		Stream 2 (AusPS) China in the world		Stream 3 (ASB) Fellows Road Law Theatre 2	
<b>Symposium: Sex-differences in metabolism: novel insights on mechanisms</b> Chair: Adam Rose		<b>Symposium: Ion Channels in different tissues</b> Chair: Brad Launikonis		<b>Symposium: Membrane Protein Biophysics</b> Sponsored by JGP Chair: Toby Allen	
		 <b>JGP</b> <small>Journal of Protein Physics</small>			
8:30	Reue K: Genetic control of sex differences in metabolic physiology	54P	8:30 Domeier T: Transient Receptor Potential Vanilloid 4 in cardiac ischaemia-reperfusion and preload elevation	58P	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	55P	9:00 Davis F: Multiscale activity imaging in the mammary gland reveals how oxytocin enables lactation	59P	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	56P	9:30 Cox C: The mechanically-gated ion channel Piezo1 acts as a mechanosensor in the endocardial endothelium: implications for health and disease	60P	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	57P	10:00 Launikonis B: A single session of sprint-interval exercise changes plasma membrane-sarcoplasmic reticulum-mitochondrial Ca2+ handling in human muscle	61P	10:00 Nishizaka T: Membrane-embedded molecular motors to propel microorganisms
10:30-11:00 Morning Tea: Lotus Hall					

# A SIMPLIFIED TRANSFER PROCESS

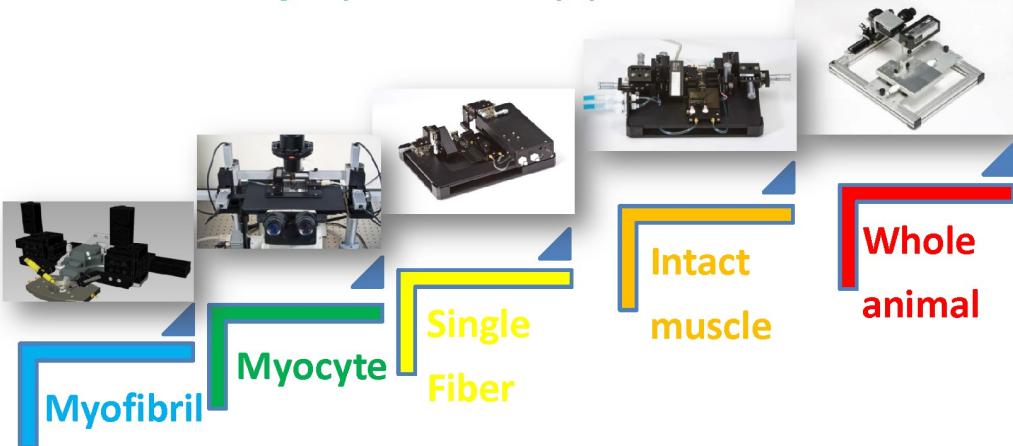
We make it easy for you to submit your study with previous reviewer comments for consideration by *JGP* editors.

**JGP.ORG/TRANSFERS**



**Aurora Scientific has been serving the muscle community for over 30 years**

**Test systems and solutions measure muscle function on sample ranging from single myofibrils all the way up to whole animal**



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

13:00-15:30	<p>80P Venniti J: Modelling Amino Acid Homeostasis in Cancerous Cells</p> <p>81P Tae H.S: <math>\alpha</math>-Conotoxin dimerization enhances potency at the human <math>\alpha</math>ta10 nicotinic acetylcholine receptor</p> <p>82P So C.L: MDA-MB-231 breast cancer cells cultured on a higher matrix stiffness show differential calcium signalling.</p> <p>83P Dennis A.L: Towards understanding the relationship between phosphor- and redox-modification of the intracellular calcium release channel (ryanodine receptor)</p>
	<p>84P Chow P: Furan-based compounds selectively block the Aquaporin-1 ion channel conductance and slow cancer cell migration and invasion</p> <p>85P Bye L.J: Nicotinic acetylcholine receptor expression and function in immune cells: The role of <math>\alpha</math>-conotoxins as neuroimmunomodulators</p>
	<p>86P Bony A.R: Modulation of native and recombinant GIRK1/2 channels by analgesic <math>\alpha</math>-conotoxins</p> <p>87P Amro Z.A: Blocking Bacterial Water Channels to Prevent Growth of <i>Staphylococcus aureus</i> Small Colony Variants</p>
	<p>88P Henderson S: Cell-free measurements of recombinant AQP1 non-selective cation channel activity</p> <p>89P Singh D.P: Effects of obesity on ryanodine receptor Ca2+ handling in rat skeletal muscle.</p>
	<p>90P Seng C.L: Methods for examining mitochondrial Ca2+ and inorganic phosphate buffering in skeletal muscle</p> <p>91P Pearce L: Chronic Ca2+ leak in ryanodine receptor variants change plasma membrane Ca2+ handling properties</p>
	<p>92P Meizoso-Huesca A: Core muscles have leaky RyRs compared to distal muscles.</p> <p>93P Trewin A: Expression of the PGC-1<math>\alpha</math>-interacting long non-coding RNA Tug1 in response to exercise</p>
	<p>94P Thompson B.K: The use of curcumin to improve functional repair of skeletal muscle post-ischaemic injury</p> <p>95P Dharmapranid: Renewal theory provides a universal quantitative framework to characterise the continuous regeneration of phase singularities in cardiac fibrillation</p>
	<p>96P Kiriaev I: Isolated fast-twitch extensor digitorium longus muscles from old mdx dystrophic mice show little force recovery 120 minutes after eccentric damage</p> <p>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</p>
	<p>98P Gray C: Dynamic Relocation of Akt in Response to Insulin</p> <p>99P Rajaraman G: Effective teaching strategies and interactive tools for student engagement in science block mode</p>
	<p>100P Goultton C: Using an online workshop tool to enhance student peer assessment of short answer questions in an introductory neuroscience course</p>
	<p>101P Frankenberg N: A different approach to think-pair-share, think-group-challenge.</p>
	<p>102P Campbell C: Increasing student engagement in Physiology practical classes with video: a pilot study</p>
	<p>103P Marden N and Ulman L: Supporting Introductory Physiology practical classes with pre- and post-laboratory online activities: impact on students' learning experience and outcomes</p>
	<p>104P Dymke A: Free energy simulations of general anaesthetic binding to a pentameric ligand-gated channel.</p>
	<p>105P Lin Y: Using computational chemistry to understand how membrane composition affects neurotransmitter transporters</p>
	<p>106P Lankage U.M: Development of a tethered bilayer lipid membrane (TBLM) pancreatic lipase sensor</p>
	<p>107P Flood E: Exploring hERG potassium channel inactivation using molecular dynamics of <i>cryo</i> EM structures</p>
	<p>108P Judd N: EDNMR as a new EPR distance for short-ranged distance measurements in biomolecules</p>
	<p>109P Purchase R: New spectroscopic perspectives on photoxystem II reaction centres</p>
	<p>110P Finol-Urdaneta, RK: Functional cell phenotyping, drug screening platform development, and identification of an ASIC1a-active therapeutic lead</p>
	<p>111P Wright, C: A modern approach to teaching anatomy and physiology to a large diverse first year cohort.</p>
	<p>112P Goodear, S: Hypoxia does not augment immunosuppression post-resistance exercise</p>

Stream 1 (AusPS) Law Theatre		Stream 2 (AusPS) China in the world		Stream 3 (AusPS) Fellows Road Law Theatre 2	
Free communication: Across the membrane		Free communication: Neuroscience:		Symposium: Membrane Protein Biophysics (2)	
15:30	Kearing 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 Tremolose: Coupling between matrix properties and protein function Chair: Amanda Buylan
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 LecT 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 Deplazas E: Membrane-disruption is necessary but not sufficient for the anti-cancer activity of the spider peptide Gomesin
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 milieus: 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 $\mu$ -therapotoxin-PM3a-induced analgesia	120P	16:30 Bellby 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 MacDermott-Opeskin H: Determining the mechanism of a novel class of mitochondrial uncoupler (20mins)
19:00	Conference Dinner: QT Canberra				

# CONFERENCE DINNER

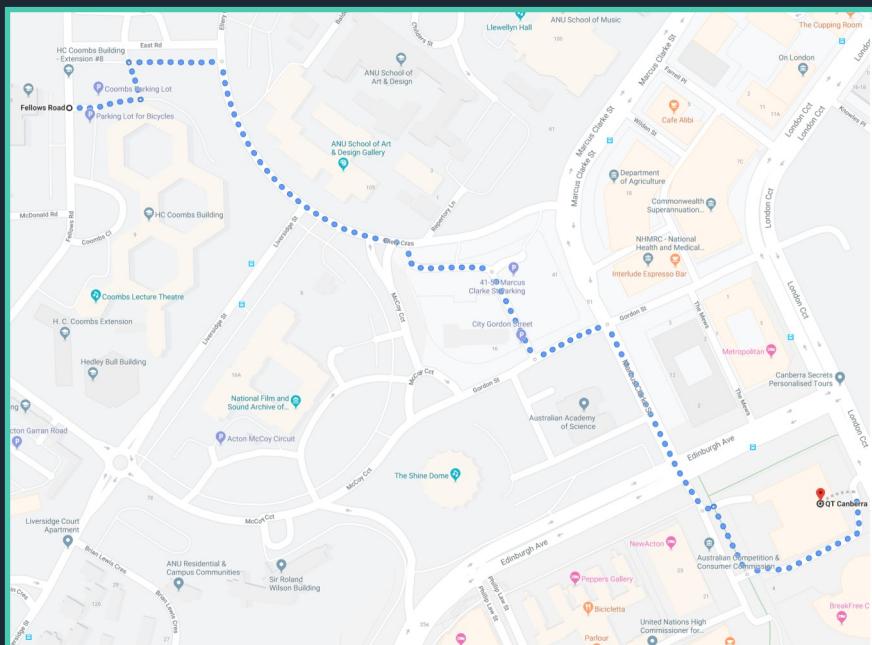
**TUESDAY 3<sup>RD</sup> DECEMBER 2019**

**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 Kibedi J; Development of tutors' dialogic and feedback skills that promote students' scientific writing	129P	9:00 Clarke R; Membrane-interaction of P-type ATPase N-termini: A possible physiological role of animal cell membrane asymmetry	134P
		9:15 Kuit T; eNotebooks in Laboratory Teaching: Developing Students Employability Skills using a Students as Partners Approach	130P		
		9:30 Day M; Use of a cloud-based interactive learning tool in Physiology practicals and beyond	131P	9:30 Coster A,C,F; Right Place, Right Time – Signalling Delays and Translocation in the Insulin Signalling System	135P
9:40	Simpson K; Making novel discoveries using high throughput technologies	9:45 Sevigny C; The Virtual Reality Human Heart: Development, scalability, and student engagement with a novel VR learning tool.	132P		
		10:00 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	133P	10:00 Heitmann S; Cardiac fibrillation as the failure of repolarisation	136P
10:20	Judson R; Using iPS technologies for muscle disease modelling and cell therapy	128P		10:30 Hossain K,R; Polarity of the ATP Binding Site of P-Type ATPases	137P
11:00 – 11:30 Morning Tea: Lotus Hall					

Stream 1 (AuPS) Law Theatre		Stream 2 (AuPS) Law Link Theatre, Law School Building (#2)		Stream 3 (AuPS) Fellows Road Law Theatre 2	
Free Communication: Exercise Physiology Chairs: Danielle Ham and Macsue Jacques	Law Communication: Innovations in Physiology Education Chair: Julia Choate	Free Communication: Innovations in Physiology Education Chair: Julia Choate	Free Communication: Channels and transporters Chair: Emilee Flood	Free Communication: Channels and transporters Chair: Emilee Flood	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	11:30 Pinar A: Does Attendance at Practicals and Workshops Predict Exam Performance in a Second-Year Physiology Subject?	146P	11:30 Nakayama Y: Corynebacterial "Force-From-Lipids" mechanosensation for industrial glutamate production	163P
11:45 Ham D: The association between aerobic capacity and telomere length in human skeletal muscle and leukocytes across the lifespan	139P	11:45 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 <i>Ftεn-/-</i> mice	140P	12:00 Cameron M.S: Integrating theoretical and practical endocrine physiology to enhance the student learning experience.	148P	12:00 Rajagopal V: Assessing cardiomyocyte excitation-contraction coupling site detection from live cell imaging using a structurally-realistic computational model of calcium release	155P
12:15 Botella J: Exercise- and training-induced skeletal muscle mitochondrial remodelling in healthy males	141P	12:15 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	12:30 Vasudeva S: Challenges and opportunities in blending physiology courses	150P	12:30 Boiteaux C: Selective conduction in the acid sensing sodium channel ASIC	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	12:45 Klein R: Effective flipped-blended design for facilitating self-directed learning in first year Anatomy and Physiology Block units	151P		
13:00 Alisopp G: The effect of normobaric hypoxia on strength adaptations to resistance training in older adults.	144P	13:00 Lexis 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	13:00 Siriwardhana R: Hard labour: an increase in myometrial Kv7.4 channel expression explains poor contractions necessitating caesarean delivery in older first-time labouring women	41P
13:15 Betik A.C: Skeletal Muscle Microvascular Dysfunction Prevails in Overweight Individuals despite Being Physically Active.	145P	13:15 Thomas C.J: Engaging students with critical analysis of literature.	153P	13:15 Lev B: State-dependent dynamic communication networks in a pentameric ligand-gated ion channel	158P
13:30 - 14:00 Lunch: Lotus Hall					

Stream 2 (AuPS)							
Law Link Theatre, Law School Building (#7)							
14:00 – 15:00							
	Education Free Communication:						
	Physiology education across the country						
	Chair: Pushpa Sinnayah						
	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					
	14:30 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					
						AuPS AGM (Seminar Room 1)	
						15:00 – 16:30	
						Education Workshop Law Link Theatre, Law School Building (#7)	

# AuPS EDUCATION WORKSHOP

---

**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) & Julie Beckman (ANU)

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

## NOTES

## NOTES

## **NOTES**

## **NOTES**

## **NOTES**

## NOTES



GE Healthcare  
Life Sciences



APAC  
SCIENTIFIC



Australian  
National  
University

