Scientific Meeting

Australian Physiological Society | Australian Society for Biophysics

HOBART · TASMANIA · NOVEMBER 2022

20 -23 NOVEMBER 2022

HOSTED BY

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Welcome to Lutruwita (Tasmania)

Acknowledgement of Country

We acknowledge the palawa/pakana people of Lutruwita, the traditional custodians of the land upon which the University of Tasmania stands.

We pay respects to Elders past and present as the knowledge holders and sharers. We honour their strong and enduring culture and knowledges as vital to the self-determination, wellbeing and resilience of their communities.

We stand for a future that profoundly respects and acknowledges Aboriginal perspectives, culture, language and history.

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Tourism Tasmania
Tasman Bridge - Brian Dullaghan,
Tessellated Pavement - Luke Tscharke
Hogarth Falls -Peter Harmsen

Welcome

It is with great pleasure that we welcome you to Hobart/nipaluna and the University of Tasmania for the 2022 AuPS | ASB scientific meeting.

We have an outstanding scientific program on offer with invited lectures, and four separate streams featuring ten AuPS symposia, six ASB themes, ten free communication sessions and over fifty posters. Complementing the program are the Welcome reception at *Aura* and the conference dinner at *The Hotel Grand Chancellor*, providing a chance to socialise while enjoying expansive views of our beautiful city and indulging in some of the finest local produce.

This year's conference sees an expansion of the traditional program with a number of new initiatives. A key focus of both Societies is the support and development of our student and ECR members. This year we have subsidised the cost of registration and expanded the ECR program to also include an new workshop and mentoring session. This is in addition to the traditional Monday workshop and mixer, and our dedicated student and ECR prizes and awards recognizing the achievements of our up-and-coming researchers.

We have experienced growing engagement with physiology education over the past years, and this demand has resulted in a dedicated education stream within the conference. This will run as a hybrid model facilitating the participation of academics from across the country, and includes workshops, prize lectures, a symposium and free communication sessions.

The 'Hot Topics' session on Wednesday will provide an opportunity to debate one of the most contentious topics in research - Publication costs - with a panel of senior researchers from AuPS and ASB providing some thought provoking discussion.

Finally, the meeting provides the chance to celebrate our most talented researchers and educators with the awarding of the AK McIntyre and Michael Roberts Prize, Young Biophysicist Award, Publication and Presentation prizes. Winners will be announced during the conference dinner and AGMs.

We hope you enjoy the conference, and also get to experience all the beauty that Tasmania has to offer.

Renee Ross

Dr Renee Ross
Chair, LOC AuPS/ASB 2022
University of Tasmania

Local Organising Committee
Dr Renee Ross, Dr Dino Premilovac,
Ms Emily Attrill, Ms Nicole Sumargo

The Venue

Medical Science Precinct
17 Liverpool Street, Hobart

Image: Medical Science Precinct, John Gollings

Registration/Welcome Desk
Registration opens on Sunday at 1:30pm for students and ECRs, and from 4pm for all conference delegates.

The Welcome/registration desk will be staffed from 8am-10:30am on Monday, Tuesday and Wednesday.

If you require assistance outside of these times, UTAS staff and students will be available throughout the event and can be identified by their red UTAS lanyard.

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

Check-in
Please check-in to the Medical Science Precinct each day on arrival. A QR code will be on display or if you prefer pen and paper, please sign in at the conference welcome/registration desk

Security
If you require any assistance or first aid during the event, security are located on the ground floor, next to the main entrance.

If there is an Emergency, please contact police, fire or ambulance on 000, and campus security on 6226 7600

IT services
If you require IT support during the conference you can visit the IT services office located off the main corridor on level 1, or call 6226 2600

You may access wifi via Eduroam, or if registered for UVisitor, IT services will send your login credentials via text message.

COVID-19

We ask you to remain vigilant and COVID-safe throughout the event.

- Follow public health advice
- Stay home if unwell and showing symptoms
- If unwell when at the conference please use a face mask and leave the event immediately
- Social distance where practicable amongst other attendees
- Wash and sanitise hands regularly

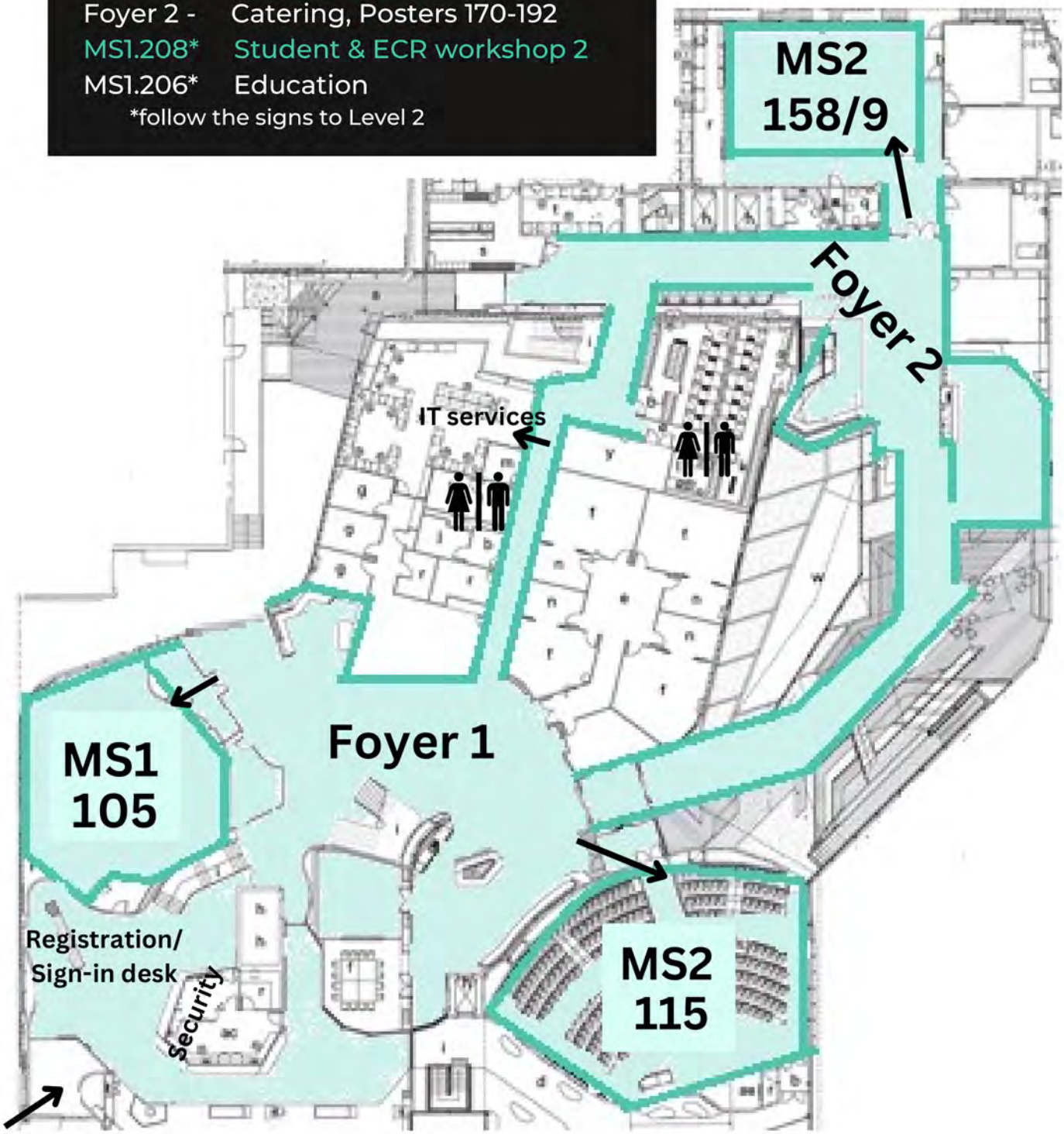
Presenters
If you are presenting a talk or poster at the conference, please check your email for instructions.

If you require assistance during the conference, please visit the registration desk, find a UTAS staff member, or contact the Chair of your sesison.

Floor Plan

MS2.115	Invited & Prize lectures / AuPS program
MS1.105	AuPS Program
MS2.158/9	ASB Program
Foyer 1	Catering, Posters 138-169 Trade displays
Foyer 2 -	Catering, Posters 170-192
MS1.208*	Student & ECR workshop 2
MS1.206*	Education

*follow the signs to Level 2



Main Entrance
17 Liverpool Street

Program highlights

Image: Tasman Bridge, Tourism Tasmania & Brian Dullaghant

AuPS Invited Lecture

Seeing the baby grow:
MRI to measure placental and cardiac function in the fetus

5pm Sunday

Prof Janna Morrison
University of South Australia

In recognition of Prof Janna Morrison's outstanding contributions to physiology research and AuPS, we are pleased to award her the honour of presenting the Invited lecture at the 2022 meeting.

Prof Morrison is Director of Health and Biomedical Innovation at the University of South Australia and Head of the Early Origins of Adult Health Research Group. In the last five years Prof Morrison has been awarded over $7M of funding and published over 200 peer-reviewed articles. Prof Morrison served on the AuPS executive council 2014-2017 and organised the annual meeting in Adelaide in 2016.

Plenary Lecture

FBP1 is a nonenzymatic safety valve that prevents insulin hyperresponsiveness

2pm Tuesday

Prof Michael Karin
UC San Diego

We are excited to welcome Prof Michael Karin as the Plenary Lecturer at this years meeting. Prof Karin has received numerous awards and is one of the most highly cited scientists in the world with over 310,000 career citations and an H index of 274 (Google Scholar).

Prof Karin is currently a Distinguished Professor of Pharmacology and Pathology at the University of California San Diego, where he has been on the faculty since 1986.

Hot Topics

2pm Wednesday

Publish or Perish...but who pays?

Join the panel discussion as senior researchers from AuPS and ASB discuss one of the most contentious topics in research - publication costs. Who should pay and does price reflect research quality?

Young Biophysicist Award

3pm Tuesday

Dr Lisanne Spenkelink, Dr Saffron Bryant and Ashleigh Solano are the three candidates for the 2022 Young Biophysicist Award. See them present their work on Tuesday afternoon, before the winner is announced at the conference dinner.

AuPS Symposia

The scientific program includes nine symposia sessions:

Scan for symposia details

- Going with the (blood) flow in health and disease
- Regulatory systems underlying the development of heart failure
- Metabolic pathways as mechanisms of cardiovascular pathophysiology
- Proglucagon-derived hormones and metabolic physiology
- Rigour and Reproducibility in Physiological Sciences
- The Physiology of Obesity- Implications for a Healthy Lifespan
- New Approaches to tackle the fatty liver disease pandemic
- Placental function and transport
- Probing neural circuits with light tools

Free Communication Sessions

- Muscle Physiology
- Cardiovascular Physiology
- Glucose Metabolism
- Maternal Physiology
- Exercise Physiology
- Neuroscience
- Signalling
- Physiology Education

Flash Talks + Poster Session

Over 50 posters will line the Level 1 main foyers with presenters from AuPS and ASB in attendance on Monday between 1:15 - 2:45pm.

The ASB poster presentations will start with a 'flash talk round' on Monday 11am (Session 2). Poster presenters will give a quick fire 3min overview of their research project before the more traditional poster session during the afternoon.

ASB Program Themes

The ASB Scientific program features a dedicated stream with six themes across the conference:

- Cell Biophysics
- Biophysics at the Membrane
- Advances in Microscopy
- Structural Biology
- Single Molecule Biophysics
- Theoretical Physics and Molecular Modelling

Physiology Education

A two day hybrid stream, featuring prize lectures, workshops, symposia and free communication sessions showcasing the best educational practice from across Australia.

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We look forward to chatting with you soon.

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Events for **Students and ECRs**

Image: Sunset at Coles Bay, Sean Scott

The conference program has many elements specifically aimed at supporting the development of up-and-coming researchers

Workshop 1

2pm Sunday

A new addition to the Student and ECR programme is the Welcome Event and workshop. The afternoon will incorporate a mixture of a social gathering, mentoring, and an open discussion of the issues which matter most to students and ECRs. Come along to hear from AuPS and ASB senior academics as they discuss their journeys through academia and share advice and tips for a successful career.

Workshop 2

4:15pm Monday

This workshop is presented by Dr Shane Huntington OAM, a successful broadcaster, CEO, business owner, academic, and strategist with a passion for science and communication. This workshop will focus on the core elements of communication and provide tools for communicating effectively. A primary outcome of this workshop will be to apply these tools to any communication challenge, such as presenting, writing, and funding applications. Audience psychology will be a key part of the program, along with an introduction to structured feedback and presentation skills.

The Mixer

6:30pm Monday

The ECR mixer is always a feature on the conference calendar. This year T42 on the Hobart waterfront will play host, offering a great chance to relax and have a fun night out with your fellow ECRs.

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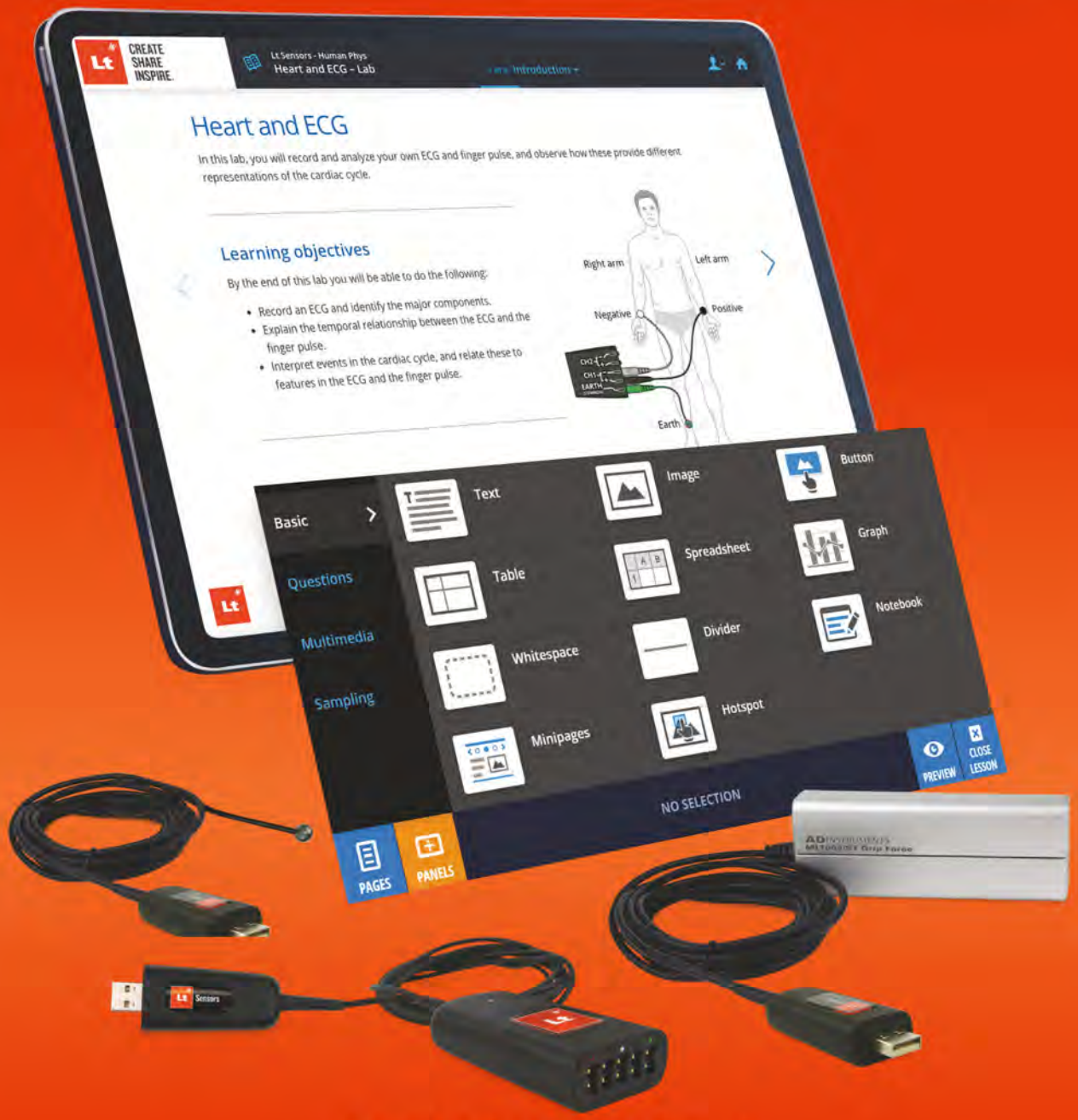

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A focus on

Physiology Education

Image: Tessellated Pavement. Luke Tscharket

The Education program has grown rapidly over the past three years and now includes a dedicated stream in the program. It features prize winning lectures, workshop, symposia and free communication sessions

Education Workshop

8:30am Tuesday

Collaborative Assessment

Facilitators: A/Prof Andrew Moorhouse & Dr Renee Ross

Continuing the tradition of working collaboratively to build and share resources, this year's Workshop asks educators to work together to develop and review assessment items that can be used in remote learning activities.

Education Symposium

8:30am Wednesday

Building Career Pathways and Work-Integrated Learning in Biomedical Sciences

Work integrated Learning (WIL) is growing in Australian Universities and Internationally, and has spread beyond compulsory internships in vocation orientated degree programs. This symposium aims to provide updates on WIL courses in Science and Health related fields. We present speakers with broad experience in developing WILs and their impacts on graduates, and who will share their learnings and experiences. WIL is not just industry internships, and the symposium also addresses other ways to prepare students for positively contributing to our society and enhance their employability.

Michael Roberts Prize Lectures

11am Tuesday

The Michael Roberts Prize is awarded to 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 AuPS.

2020 Winner
A/Prof Charles Sevigny

2021 Winner
A/Prof Christian Moro

Free Communication Sessions

Tuesday & Wednesday

Learn from physiology educators from across the country as they share their teaching practice and innovation in three free communications sessions:

- Online learning & engaging/motivating students
- Trying different Teaching approaches and graduate careers
- Staff &/or Students working as teams in learning

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Conference Program

image: Hartz Peak Walk, Stu Gibson

This is a joint meeting of AuPS and ASB. The program contains joint sessions, in addition to dedicated streams for each Society. The full conference program and associated events, are open to all delegates registered for the conference.

Scan for e-program and abstracts

Australian Physiological Society

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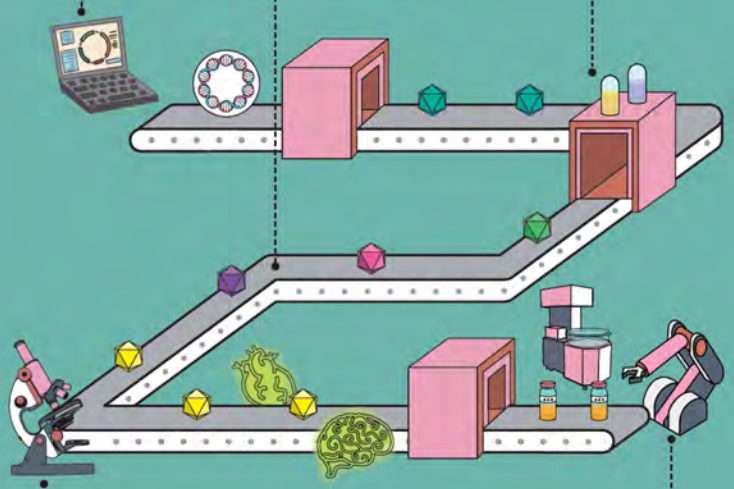

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Sunday, 20 November

13:30		**MSP Foyer**
	13:30	**Student and ECR registration opens**
14:00		**MS2 115 LT**
	14:00	**Student and ECR Workshop** *Chair: Charlotte Phelps (AuPS ECR representative)* *A new addition to the Student and ECR programme for Hobart 2022 is the Welcome Event. The afternoon will incorporate a mixture of a social gathering, mentoring, and an open discussion of the issues which matter most to students and ECRs. Discuss the next steps and the support you need to build a bridge from ECR to a successful career in research!*
16:00		**MSP Foyer**
	16:00	**Registration opens** Register your attendance and collect your registration pack at the Welcome Desk upon entry to the Medical Science Precinct (17 Liverpool Street, Hobart).
17:00		**MS2 115 LT**
	17:00	**Invited Talk** Chair: Robyn Murphy **Seeing the baby grow: MRI to measure placental and cardiac function in the fetus** — **Prof Janna Morrison**, University of South Australia
18:30	18:30	**Aura Restaurant and Bar**
		Welcome Reception The Welcome Reception at the Aura Restaurant and Bar will follow the Invited Talk and is included in your registration.

Monday, 21 November

8:30am

MS2 115 LT

Symposium: Regulatory systems underlying the development of heart failure

Chair: Jim Bell

8:30	Acetylation of myofilament proteins modulate diastolic function	Kathleen Woulfe University of Colorado	2S
9:00	Cardiac protein phosphatases: more than an 'off' switch for protein kinases	Kate Weeks University of Melbourne	3S
9:30	Adiponectin signalling as a therapeutic target for diabetic cardiomyopathy and heart failure	Miles De Blasio Monash University	4S
10:00	Physiological Society NZ, New & Emerging Researcher Award - 2022 Winner: Reinstating heart rate variability restores cardiac function in chronic heart failure sheep	Julia Shanks University of Auckland	5S

MS1 105 LT

Symposium: Going with the (blood) flow in health and disease

Chair: Renee Ross & Dino Premilovac

8:30	The role of pericytes in the regulation of brain blood flow and their dysfunction in dementia	Brad Sutherland University of Tasmania	6S
9:00	Transcriptomic profiling of the mouse aorta to identify novel cellular drivers of aortic stiffening in hypertension	Maria Jelinic La Trobe University	7S
9:30	Harnessing non-invasive ultrasound to understand brain blood flow regulation following stroke	Dino Premilovac University of Tasmania	8S
10:00	Muscle microvascular flow regulation in health and disease	Michelle Keske Deakin University	9S

MS2.158/159

Cell Biophysics

Chair: Saffron Bryant

8:30	Mechanotransduction in Neutrophils	Sara Baratchi	85O
8:50	Structural mechanisms of human Aquaporin-1 ion channel gating and block by divalent cations, analysed by histidine scanning mutagenesis.	Andrea Yool	86O
9:10	Development of a multiplexed biophysical method of analysis for quantification of DNA repair factor dynamics.	Shikun (Tony) Ma	87O
9:30	A novel triglyceride tethered bilayer lipid membrane (tBLM) architecture	Upeksha Shashikala (Randunu)	88O
9:50	Hyper-phosphorylation induces structural alterations and exacerbates the cytotoxicity of alpha-synuclein in Parkinson's Disease pathogenicity	Minal Chaturvedi	89O
10:10	A molecular mechanism for the lupus causing mutation in the RNA receptor TLR7	Ben Corry	90O

10:30

Morning Tea (Main Foyer)

11:00am	MS2 115 LT			MS1 105 LT			MS2.158/159
	Symposium: **New approaches to tackle the fatty liver disease pandemic** Chair: Mark Febbraio			**Free Communications:** **Muscle Physiology - All things Muscle** Chair: Justin Hardee and Adam Trewin			**ASB FLASH TALKS** **Poster Pitch** Chair: Dona Whelan & Matthew Baker
11:00	**AD Instruments Presentation**			**11:00**	**Aurora Scientific Presentation**		FLsh Talk Round: Authors (170P-190P listed below in "Poster Session") will present a 2-3min poster pitch.
11:05	The gut/liver axis: a novel therapeutic approach to treat NASH	Michael Karin UCSD	10S	**11:05**	**Interrogating the biological roles of dystrophin and utrophin in dystrophic muscle adaptations to exercise**	**Justin Hardee**	15O
				11:20	**The effect of gestational stress on behavioral and physiological phenotypes in the dystrophin-deficient mdx mouse**	**Saba gharibi**	16O
11:35	Using single Nucleus RNA sequencing of pre-malignant liver to predict NASH driven liver cancer	Nina Tirnitz-Parker Curtin University	11S	**11:35**	**Muscle stem cell function is maintained in mouse models of type 1 diabetes**	**JIn Chung**	17O
				11:50	Fibre type-specific abundance of dysferlin in rodent skeletal muscle	**Stefan Wette**	18O
12:05	Identification of a blood biomarker to predict NASH driven liver cancer	Benoit Smeuninx Monash University	12S	**12:05**	Isolated Extensor Digitorum Longus muscles from old mdx dystrophic mice show little force recovery 120 minutes after eccentric damage	**Leonit Kiriaev**	19O
				12:20	Phosphorylation of C18ORF25 regulates skeletal muscle function	**Ronnie Blazev**	20O
12:35	Mouse strain-dependent variation in the NASH lipidome – Novel therapeutic avenues for NAFLD	Magda Montgomery University of Melbourne	13S	**12:35**	Biomechanical properties of dysferlin-deficient skeletal muscle and the impact of muscle type and	**Erin Lloyd**	21O

13:00 - 15:00

Lunch & Poster Session (Level 1, Foyer 1 & 2)

Lead authors will be in attendance from 1:15 - 2:45pm

AuPS Posters (138P-169P)

A multiscale model of calcium release reveals a novel mechanism for calcium wave initiation	Derek Laver	138P
The relationship between muscle mass and function with bone remodelling markers in older adults: effects of acute aerobic and resistance exercise	Cassadra Smith	139P
LncRNA Tug1 regulates expression of the mitochondrial calcium uniporter complex in myotubes and cardiomyocytes.	Adam Trewin	140P
Subtype-specific block of glioblastoma motility through dual inhibition of water and ion flux	Alanah Varricchio	141P
Learning from skeletal muscle to treat metastatic cancer	Alastair Saunders	142P
New insights into assessment of mitochondrial dysfunction and oxidative stress in preclinical models of diabetic cardiomyopathy	Alex Parker	143P
Differential responses in muscle atrogene expression in a mouse model of critical illness	Amy Bongetti	144P
Effects of sex on skeletal muscle phenotype in heart failure patients	Annabel Critchlow	145P
The role of N-acetylcysteine (NAC) in reducing pathological skeletal muscle fibre branching in an mdx mouse model of human Duchenne Muscular Dystrophy	Asma Redwan	146P
Response of circulating miRNAs to acute exercise: A systematic Review and Meta-Analysis	Danielle Hiam	148P
Establishing a platform mediated avoidance paradigm in female rats	Elise Cleary	149P
The cardiovascular effects of mechanical ventilation	Ella Smalley	150P
Establishing a platform mediated avoidance paradigm in male rats	Fergus Scott	151P
Sex differences in cardiovascular risk factor responses to resistance and endurance training in a primary prevention cohort	Hannah Thomas	152P
What to do when Westerns go wild	Heidy Latchman	153P

Can an old dog learn new tricks? Novel applications of Microdialysis for detecting skeletal muscle reactive oxygen species and assessing microvascular endothelial function in hypertensive populations	Hollie Speer	154P
Integrative transcriptomic and proteomic analysis show circulating osteoprogenitors to have a mixed immune and mesenchymal progenitor function in humans	Jack Feehan	155P
Calcium release-activated channel activity in the uterus – CRAC-ing labour contractions	Jawaher Alfaidi	156P
A single session of high intensity interval exercise in hypoxia modulates changes in mitochondrial biogenesis related gene and protein in human skeletal muscle	Jia Li	157P
Metabolic regulation of skeletal muscle regeneration after injury	John Nguyen	158P
High-glucose ingestion and acute exercise elicit dynamic and individualised responses in systemic markers of redox homeostasis.	Lewan Parker	159P
Characterising the opposing impact of obesity and exercise training on the cardiac phenotype in mice	Nimna Perera	160P
Thyroglobulin antibodies impair fertility and litter parameters and impact fetal survival in a rodent model of Autoimmune Thyroiditis	Rebecca Brady	161P
Hematopoietic Prostaglandin D Synthase Inhibitor PK007 Decreases Muscle Necrosis in DMD mdx Model Mice	Sai Yarlagadda	162P
Regeneration of mouse skeletal muscle after myotoxic injury is impacted by fucoidan supplementation	Samantha Kucewicz	163P
Utilizing a "four core genotypes" rat model to investigate sex differences in human disease	Shanie Landen	164P
Regular insulin administration increases muscle mass and exercise performance in otherwise healthy Sprague Dawley rats	Sophie Mayne	165P
Vascular RAGE and AGE binding protein expression and function in gestational diabetes.	Timothy Murphy	166P
Autophagy Flux in Human Peripheral Blood Mononuclear Cells in the 24 h Fasted and Fed State	Vicky Kuriel	167P
The urothelium and lamina propria as an alternative target for clinical antimuscarinics	Vineesha Veer	168P
What makes a good B0AT1 (SLC6A19) inhibitor?	Yashan Jiang	169P

ASB Posters (170-192):

Machine learning approaches for the discovery and optimization of oxazolidinones with therapeutic potential	McKenna Buckley	170P
The mechanism and structural basis of ion conduction in an inward rectifier potassium channel	Ruitao Jin	171P
Investigating molecular dynamics and sequence dependency of invading DNA strand in Homologous recon	Cheree Fitzgibbon	172P
Cardiac forces regulate zebrafish heart valve delamination by modulating Nfat signaling	Wei-Yan Chow	173P
Elucidating mitochondrial dynamics and localisation upon T cell activation through advanced microscopy	Sofia Alfonso	174P
Benchmarking biophysical readouts of nanoscale chromatin compaction in live cells.	Kedi Wang	175P
Super-Resolution Analysis of Bisphenol A Effects on Meiotic Recombination in spermatocytes	Lynette Mirembe	176P
Application of super resolution microscopy to visualise immune activated interactions between lipid droplets and STAT proteins	Abbey Milligan	177P
Imaging changes to the membranes of live fungal cells caused by exposure to gold nanoparticles	Rowan Penman	178P
Identifying Lipid Mixtures for Optimal Tethered Bilayer Lipid Membrane Sensing of Lipase Activity	Samara Bridge	179P
Structure-function insight into the two-component DNA repairsystem of Mycobacterium tuberculosis	Joydeep Baral	180P
IP_3R activity increases propensity of RyR-mediated Ca^{2+} sparks by elevating dyadic $[Ca^{2+}]$	Joshua Chung	181P

Simulating the effects of delipidation on the mechanosensitive channel of small conductance MscS	Yiechang Lin	182P
Image correlation spectroscopy of DNA double strand break repair foci structure	Niall Karunaratne	183P
Structure-activity relationship of α-conotoxin Mr1.1 at the human α9α10 nicotinic acetylcholine receptor	Han-Shen Tae	184P
Involvement of Alpha-Subunit N-Termini in the Mechanism and Regulation of the Na^+,K^+-ATPase	Milna Chennath	185P
A hybrid approach to membrane disruption based intracellular delivery	William Hansen	186P
Single-molecule genotyping of thousands of variants	Stefan Mueller	187P
Binding modes of diverse sodium channel inhibitors inside the pore	Elaine Tao	188P
How the world lost one of its most effective anti-malarials to mutations in a Malarial multi-drug resi	John Tanner	189P
Controllable liposome binding interactions using PEG-mediated DNA nanostructures	James Gaston	190P
Susceptibility of leukemia cells to synergistic treatment with vitamin C and select flavonoids	Suganeya Soundararajana	191P
Isoform specificity of Na+,K+-ATPase regulation by protein kinase C	Emma-Lucille Blayney	192P

15:00

MS2 115

Free Communications:
Cardiovascular Physiology - the heart of the matter

Chair: Kate Weeks

15:00	MicroRNA-205: a novel epicardial regulator of cell cycle and cardiac growth in the perinatal heart	**Patrick Burgon**	22O
15:15	Bitter Taste Receptors (T2Rs) in the Heart – a New Cardiovascular Physiology?	**Walter Thomas**	23O
15:30	Inactivation of the local cardiac renin angiotensin system improves cardiac performance after myocardial infarction	**Zunha Lu**	24O
15:45	AAV-directed expression of Neuregulin 1-b1 drives cardiac enlargement in neonatal mice – a critical role for Neuregulin 1-b1 and ErbB4 in postnatal cardiomyocyte survival	**Hui Yi Khoo**	25O
16:00	MiR-558 inhibitor induces cardiac proliferation after myocardial infarction	**Catherine Dimasi**	26O

Session 1: MS1 105

Free Communications:
Glucose Metabolism - The Sweet Science

Chair: Magdalene Montgomery

15:00	Post-weaning early life dietary macronutrient balance variably affects biometric and metabolic outcomes in adulthood	**Adam Rose**	27O
15:15	The designer cytokine IC7Fc promotes weight loss by decreasing digestive efficiency in obese mice	**Gideon Kang**	28O
15:30	Pericyte characterisation in healthy and type 2 diabetic skeletal muscle microvasculature	**Emily Attrill**	29O
15:45	Ceramide metabolism in skeletal muscle – questioning previous	**Sarah Turpin-Nolan**	30O
16:00	**Loss of Acyl-CoA dehydrogenase family member (ACAD10) does not alter whole-body metabolism or metformin action**	**Darren Henstridge**	31O

MS158/159

Biophysics at the Membrane #1

Chair: Gary Bryant

15:00	**Using Tethered Bilayer Lipid Membranes to test Phospholipase A2 Activity as a Biomarker for IBD Flare Events**	Harry Clarke	91O
15:20	**Nanotechnology and biopharmaceutics: molecular engineering of self-assembling therapeutic peptides for intrinsic**	Celine Valery	92O
15:40	**The synergy of a Lactoferrin-derived peptide with the antifungal drug Amphotericin B is lipid-mediated**	**Lissy Maike Hartmann**	93O

16:15

MS1 207/208

16:15 **"Savant Thakur" Student and ECR Workshop 2**

The 'Savant Thakur ECR Workshop' is intended for junior researchers (honours, PhD and up to 10 years post-PhD). Students and ECRs from both AuPS and ASB are welcome to attend

The topic of this year's workshop is Science Communication, which will be run by Dr Shane Huntington OAM.

18:30

18:30 **Student and ECR Mixer**

Tuesday, 22 November

	MS2 115 LT	MS1 105 LT	MS2. 158/159	MS1 206
8:30am	Symposium: Proglucagon-derived hormones and metabolic physiology Chair: Adam Rose	Symposium: Rigour and Reproducibility in Physiological Sciences Chair: Glenn Wadley & Severine Lamon	Single Molecule Biophysics Chair: Lisanne Spenkelink	Education Workshop: Collaborative Assessment Facilitators: Andrew Moorhouse & Renee Ross
	8:30 Vectorbuilder Presentation	8:30 Why retractions are growing so fast - and why there still aren't enough — Ivan Oransky, Retraction Watch, 36S		8:30 Welcome and Outline
	8:35 Control of metabolism by proglucagon-derived hormones from the gut — Damien Keating, Flinders University, 32S		8:50 Perfringolysin O pore formation dynamics: monomeric interactions, membrane tracking and membrane composition effects — Conall McGuinness, 94O	8:40 Australia wide consensus on Core Concepts in Physiology — Kathy Tangalakis, 115E
	9:05 The role of a bile acid-GLP1 axis in the regulation of glucose metabolism — Tongzhi Wu, The University of Adelaide, 33S	9:10 Research Quality: you should be worried! — Simon Gandevia, NeuRA, 37S	9:10 Spatiotemporally Mapping Thermal Dynamics of Lysosomes and Mitochondria using Cascade Organelle-Targeting Upconversion Nanoparticles — Qian (Peter) Su, 95O	9:00 Breakout Group Session
	9:35 Integration of glucose and amino acid metabolism by glucagon — Clinton Bruce, Deakin University, 34S		9:30 A fluorescently-tagged peptide toxin, Cy5-HsTX1[R14A], as a tool for KV1.3 visualisation — Dorothy Wai, 96O	
		9:50 Freezer Study: An Investigation of the Stability of Skeletal Muscle Proteins after prolong freezer storage — Noni Frankenberg, La Trobe University, 38S	9:50 3D super-resolution imaging of whole nuclear lamina — Ashley Rozario, 97O	
	10:05 Hepatic glucagon action in obesity and type 2 diabetes: insights from mouse models — Yuqin WU, Monash University, 35S	10:10 Technical considerations when assessing gene expression in human skeletal muscle using quantitative real-time PCR — Jujiao Kuang, Victoria University, 39S	10:10 Investigating biological noise: building a tuneable model system with DNA nanotechnology and droplet hydrogel bilayers — Alexander Mason, 98O	10:00 Discussion and Review
10:30	Morning Tea (Main Foyer)			

11:00 — MS2 115 LT

AuPS Michael Roberts Prize Lecture

Chair: Andrew Moorhouse

11:00	2020 Prize Winner: Empowering student ownership through flexibility, authenticity, and co-creation.	A/Prof Charles Sevigny, University of Melbourne	40I
11:30	2021 Prize Winner: The school of hard knocks: what did not work when introducing technology-enhanced learning to physiology lectures, labs and workshops.	A/Prof Christian Moro, Bond University	41I

12:00

MS2 115 LT — Free Communications: Maternal Physiology - Mum's the word

Chair: James Cuffe

12:00	Characterising brain inflammation during pregnancy in a new mouse model of metabolic syndrome	Abdiweli Warsame	42O
12:15	Thyroglobulin antibody positivity induces maternal hyperglycaemia and increases placental weight in a Lewis rat model	Nykola Kent	43O
12:30	The Effects of Maternal Hyperglycaemia During Pregnancy on One-Carbon Metabolism	Dayna Zimmerman	44O
12:45	Metabolic syndrome in pregnancy causes fetal growth restriction and attenuates placental leukocyte populations	Maral Baghaei	45O
13:00	Transthyretin binds to soluble endoglin: a possible role for transthyretin in the prevention of preeclampsia?	Melanie Young	46O

MS1 105 LT — Free Communications: Exercise Physiology - Moving right along

Chair: Noni Frankenberg

12:00	The abundance of cell-free mitochondria are increased in human blood following an acute bout of endurance exercise	Glenn Wadley	47O
12:15	Preliminary results from an investigation of exercise timing to mitigate postprandial hyperglycaemia and vascular dysfunction in healthy adults	Laura Smith	48O
12:30	C18ORF25 is a novel exercise-regulated AMPK substrate regulating skeletal muscle function	Yaan Kit Ng	49O
12:45	Metabolomic analysis of mouse skeletal muscle and liver responses to acute exercise and disruption of AMPK-glycogen binding	Mehdi Belhaj	50O
13:00	The role of testosterone in skeletal muscle adaptation to resistance training in pre-menopausal females	Sarah Alexander	51O

MS2. 158/159 — Biophysics at the Membrane #2

Chair: Toby Bell

12:00	From Superbugs to tBLMs: increasing the complexity in model membrane systems.	Ingo Koeper	99O
12:20	Effect of membrane composition on lipid packing and solute permeability.	Lauren Lowe	100O
12:40	Rational design of potent ultrashort antimicrobial peptides with programmable assembly into nanostructured hydrogels	Priscila Cardoso	101O

MS1 206 — Free Communications: Trying different Teaching approaches & graduate careers

Chair: Melissa Cameron

12:00	Re-creating an introductory physiology unit in the Core Concepts form	Sarah Etherington	116E
12:15	Incorporating planetary health concepts into physiology.	Christian Moro	117E
12:30	Clinical and Translational Physiology: Student perception of processed based learning to create an Authentic learning experience	Joseph Rathner	118E
12:45	Alumni graduate career pathways as a learning tool to assist career planning	Caroline Taylor	119E
13:00	A journey to BSEEN: bringing career pathways to the Biomedical Science experience	Judit Kibedi	120E

13:15

Lunch (Level 1 Foyer)

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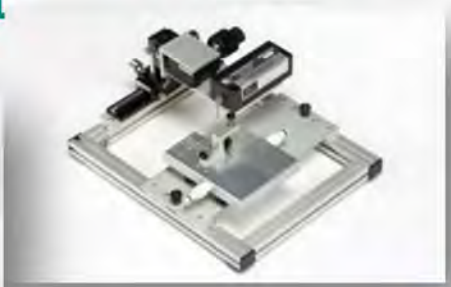

Whole animal

14:00 — MS2 115 LT

Plenary Lecture

Chair: Robyn Murphy

14:00	Plenary Lecture: FBP1 is a nonenzymatic safety valve that prevents insulin hyperresponsiveness	Prof Michael Karin, UC San Diego	52I

15:00

MS2 115

Symposium: The Physiology of Obesity - Implications for a Healthy Lifespan

Chair: Matt Watt

15:00	APAC Scientific Presentation		
15:05	Obesity and the brain- how disrupting neural networks causes diabetes	Garron Dodd, University of Melbourne	53S
15:35	Obesity and cancer- metabolic reprogramming and cancer progression	Renea Taylor, Monash University	54S
16:05	Obesity and reproduction- oocyte quality and fertility	Rebecca Robker, University of Adelaide	55S
16:35	TBC	Matthew Watt, University of Melbourne	56S

MS1 105

Free Communications: Neuroscience - Brain matters

Chair: Jennie Cederholm + Nathan Absalom

15:00	Novel primary afferent auditory and vestibular neuron phenotypes in the mouse inner ear resolved using peripherin promoter-driven transgene reporters and subtype-selective immunofluorescence	Lily Pearson	57O
15:15	Maintenance of hearing sensitivity in an ultraquiet environment requires olivocochlear efferent feedback	Jennie Cederholm	58O
15:30	Impaired neuromuscular signalling is a feature of Motor Neuron Disease	Peter Noakes	59O
15:45	Single point mutation of miRNA-873 and the synaptic protein neurexin induce autism-like behavioural changes and hippocampal dysfunction in a mouse model.	Helena Parkington	60O
16:00	Epileptic Encephalopathies associated with gain-of-function GABAA receptor variants are more severe than loss	Nathan Absalom	61O
16:15	Microglia Associate with the Vasculature and Pericytes in the Healthy and Inflamed Brain	Catherine Foster	62O
16:30	Ablation of pericytes impedes motor function, induces blood-brain barrier leakage, and stimulates glial cell activation	Jake Cashion	63O
16:45	Insulin infusion increases brain blood flow in healthy Sprague Dawley rats	Nicole Sumargo	64O

MS2. 158/159

Young Biophysicist Award

Chair: Liz Hinde

15:00	Single-molecule genotyping of thousands of variants	Lisanne Spenkelink	102O
15:30	Deep eutectic solvents for cryopreservation	Saffron Bryant	103O
16:00	Brightness cross correlation spectroscopy quantifies protein dynamics as a function of stoichiometry within live cells.	Ashleigh Solano	104O

MS1 206

Free Communciations Online learning & engaging/motivating students

Chair: Kay Colthorpe

15:00	Redesigning a subject: What do students think of pre-recorded videos and high-stake team projects?	Angelina Fong	121E
15:15	The use of online resources to explain difficult physiological concepts by medical students at a Middle Eastern university – shouldn't we do something about this?	Sean Holroyd	122E
15:30	Curating student learning in virtual galleries	Craig Campbell	123E
15:45	Predicting Physiology Student Performance from LMS Data in the Post-COVID Era	Ari Pinar	124E
16:00	To Quitch or not to Quitch: Using a gamified mobile app to increase student performance and engagment	Iris Lim	125E
16:15	Can an anatomy and physiology bridging program impact first year University science engagement?	Puspha Sinnayah	126E

18:30 — Conference Dinner: Hotel Grand Chancellor

Wednesday, 23 November

8:15 Breakfast will be available from 8:15am

9:00

MS2 115 LT

Symposium: Placental function and transport
Chair: Ashley Meakin and Janna Morrison

9:00	Characterisation of placental-specific cytochrome P450 enzyme activity in response to fetal growth restriction	Ashley Meakin, University of South Australia	65S
9:30	Placental one carbon metabolism and complications of pregnancy	James Cuffe, University of Queensland	66S
10:00	Oxidative stress and the placental renin-angiotensin system	Sarah Delforce, University of Newcastle	67S
10:30	The Placenta: A Window into Maternal Disease	Rebecca Simmons, University of Pennsylvania	68S

MS1 105 LT

Free Communciations: The right (signalling) path
Chair: Gregory Gauthier-Coles and Stephan Broer

9:00	Transciptome analysis of the effects of polarized photobiomodulation on human dermal fibroblasts	Nicholas Tripodi	69O
9:15	Identification and characterization of a novel SNAT2 (SLC38A2) inhibitor reveals synergy with glucose transport inhibition in cancer cells	Stefan Broer	70O
9:30	Sulforaphane attenuates cancer-induced muscle wasting in C2C12 myotubes	Wenlan Li	71O
9:45	A combination screen finds inhibition of GCN2 sensitises growth of MDA-MB-231 and HPAFII cancer cell lines to CDK inhibitors	Gregory Gauthier-Coles	72O
10:00	Treatment of non-alcoholic steatohepatitis with the designer cytokine IC7Fc	Jingjing Zhao	73O
10:15	Urinary bladder contractions and the influence of extracellular calcium	Charlotte Phelps	74O
10:30	Novel role for protein kinase D in cardiac extracellular matrix signalling	Mark Renton	75O
10:45	Liver-derived small extracellular vesicles regulate glycemic control through increased insulin secretion	Paula Miotto	76O

MS2. 158/159

Advances in Microscopy
Chair: Ashleigh Solano

9:00	Ultra-resolution in the cell nucleus with single molecule expansion microscopy	Toby Bell	105O
9:20	Behavior of citrate-capped ultrasmall gold nanoparticles on a supported lipid bilayer interface at atomic resolution	Rashad Kariuki	106O
9:40	Tracking the nuclear wide dynamics of live cell nucleosome proximity by fluorescence	Elizabeth Hinde	107O
10:00	How Do Steroids Impact Batten's Disease?	Trang Do Le	108O
10:20	Interrogating the biophysics of protein cage nanoreactors	Eric Jenner	109O
10:40	Behaviour of citrate-capped gold nanoparticles at biomembranes – atomic insight at supported lipid bilayer and liposome interfaces.	Aaron Elbourne	110O

MS1 206

Education Symposium: Physiology Education: Building Career Pathways and Work-Integrated Learning in Biomedical Sciences
Chair: Andrew Moorhouse

9:00	AD Instruments Presentation		
9:05	The pleasures and perils of setting up a biomed WIL as COVID hits	Julia Choate, Monash University	127E
9:30	Building career awareness and skills throughout the Health Sciences Degree	Brianna Julien, La Trobe University and Louise Lexis, La Trobe University	128E
9:55	Enriching a WIL experience by fostering habits of head, heart and hand	Dr Chris Adams, University of Tasmania	129E
10:20	Employability for Science Degrees: foundations, challenges and options	Elizabet Johnson, Deakin University	130E

11:00 Morning Tea (Main Foyer)

11:30

MS2 115 LT

Symposium:
Metabolic pathways as mechanisms of cardiovascular pathophysiology

Chair: Lea Delbridge

11:30	Strange species-specific sugar metabolic adaptations yield cardiac pathophysiology insights	Dunja Aksentijevic, Queen Mary University of London	77S
12:00	The atypical Alpha Kinase 3 regulates sarcomeric protein metabolism in cardiomyopathy	James McNamara, Murdoch Children's Research Institute	78S
12:30	Lipid dysregulation and cardio - vascular implications	Anna Calkin, Baker Heart & Diabetes Institute	79S
13:00	Reinstating heart rate variability improves cardiac output in heart failure - novel metabolic insights from proteomics	David Crossman, University of Auckland	80S

MS1 105 LT

Symposium:
Probing neural circuits with light tools

Chair: John Power & Andrew Moorhouse

11:30	Optogenetic approaches for the modulation of membrane excitability and synaptic plasticity	John Lin, University of Tasmania	81S
12:00	Neuromodulation of striatal neurons and the encoding of goal-directed learning	Chelsea Goulton, UNSW Sydney	82S
12:30	Remapping neural circuits to mediate cross modal plasticity between seeing and feeling	Hiroaki Wake, Nagoya, Japan	83S
13:00	Neural circuits that mediate drinking	Bowen Dempsey, Macquarie University	84S

MS2. 158/159

Theoretical Physics and Molecular Modelling

Chair: Matt Baker

11:30	A multi-scale kinetic and spatial model of yeast replication and prion transmission	Damien Hall	111O
11:50	How an acid trip saves malaria: a proton-transfer mechanism for the malaria lactate-proton transporter PfFNT	Ciara Wallis	112O
12:10	Computational modelling of metabolism within the ageing heart	Michael Pan	113O
12:30	Utilising Enhanced Sampling to Resolve a Conducting Conformation of the CFTR Ion Channel	Miro Astore	114O

MS1 206

Free Communciations
Staff &/or Students working as teams in learning

Chair: Angelina Fong

11:30	How equipped are first year undergraduate students in navigating common teamwork challenges?	Nilushi Karunaratne, Emilee Molcik & Betty Exinataris	131E
11:45	Evaluating students' awareness of their group work capabilities in physiology laboratory classes	Kay Colthorpe	132E
12:00	Students designing for students – using a "deteriorating patient" to teach second year physiology	Melissa Cameron	133E
12:15	Comparing student and academic grading of assessment tasks in an introductory neuroscience course	Jennie Cederholm	134E
12:30	Too many is not enough: exploring effective motivation strategies in nursing and midwifery students	Luli Faber	135E
12:45	Introducing learning workshops into the biosciences: A student-staff partnership	Louise Ainscough	136E

13:15

Lunch (Level 1 Fover)

14:00

MS2 115 LT

14:00 HOT TOPICS - AuPS and ASB Joint session
Publish or Perish...but who pays?
Join the panel discussion as senior researchers from AuPS and ASB discuss one of the most contentious topics in research - publication costs. Who should pay and does price reflect research quality?

2:00

15:00

MS2 115 LT

15:00 AuPS AGM + Prizes

MS2 158/159

15:00 ASB AGM + Prizes

AUSTRALIAN SOCIETY FOR BIOPHYSICS

16:30

Meeting Close