Plenary speakers

AuPS Overseas Plenary Lecture:
Prof Robert S. Kass, Chairman and Hosack Professor of Pharmacology, Columbia Univ NY. Cardiac ion channels, arrhythmias and gene defects.

AuPS Plenary Speaker:
A/Prof Dirk Van Helden, Principal Research Fellow, School of Biomedical Sciences and Pharmacy, Faculty of Health, University of Newcastle. Calcium signalling, pacing and rhythmic cell activity.

ASB Plenary Speaker:
Prof Robert T. Dirksen, Department of Pharmacology and Physiology, School of Medicine and Dentistry, Univ Rochester Medical Center, NY. Control of calcium release in muscle.

ASB Plenary Speaker:
Prof Richard Callaghan, Oxford Multidrug Resistance Group, Merton College, Oxford University. Drug resistance and multidrug transporters.

Scandinavian Physiological Society Exchange Lecturer:
Prof Erik Richter, Physiology and Exercise Physiology, Copenhagen Muscle Research Centre, Institute of Exercise and Sport Sciences, Univ of Copenhagen. Energy metabolism, molecular signalling, vascular perfusion and gene expression in muscle.

Symposia (not listed in order of presentation)

AFFIL'N	SYMPOSIUM	SPEAKERS AND TOPICS (final titles TBA)
ASB	Fundamentals of biophysics: Development of mathematical and computational methods. Chair John Gehman, Chemistry, Melbourne University	• Philip Kuchel; University of Sydney and Singapore Bioimaging Consortium. Erythrocyte shape, metabolism and membrane transport - computations. • Mehdi Mobli; University of Queensland, Institute of Molecular Bioscience. Fast acquisition of multidimensional NMR experiments by maximum entropy reconstruction of non-uniformly sampled data. • David Szekely; Victor Chang Cardiac Research Institute. Toward the virtual heart: GPU accelerated interactive simulations of cardiac function. • Adelle Coster; University of New South Wales. Vesicle docking and Delivery: Life in the TIRF zone.
ASB	Computational studies on biological and	• Alan Mark, University of Queensland. The induction and stabilization of

	synthetic nanotubes Chair: Shin-Ho Chung, Computational Biophysics Research, Australian National University	transmembrane pores by peptides. • Serdar Kuyucak, University of Sydney. Free energy simulations of Asp/Glu transporter GltPh. • Ben Corry, University of Western Australia. Monitoring the conformational changes involved in MscL channel gating using FRET microscopy and simulation. • Tamsyn Hilder, Australian National University. Mimicking biological ion channels using nanotubes. *International speaker:* • *Toby Allen, University of California Davis.* Selective ion binding and its role in potassium channel selectivity.
Joint ASB and AuPS	Mechanisms of multidrug resistance – the role transporters in human disease Chairs: Megan O'Mara University of Queensland, and Chris McDevitt, University of Adelaide	• Melissa Brown, Flinders University. Bacterial multidrug resistance pumps • Rowena Martin, Australian National University. Multidrug resistance in the malarial parasite. • Tony George, University of Technology Sydney. Perspectives on multi-drug resistance. *International speakers:* • *Richard Callaghan, Oxford University* (also presenting as an ASB Plenary speaker). ABCB1, ABCG2 multidrug resistance structure-function relationships. • *Susan PC Cole, Queen's University, Canada*. Molecular mechanisms of drug sensitivity and resistance.
Joint ASB and AuPS	Skeletal muscle: the coupling of excitation to contraction Chair: Dr Nicole (Nikki) Beard, John Curtin School of Medical Research ANU	• Brad Launikonis, University of Queensland. Voltage-dependent and -independent Ca^{2+} entry into skeletal muscle during excitation-contraction coupling. • Travis Dutka, La Trobe University, Coupling and uncoupling of the voltage-sensors and Ca^{2+} release channels in skeletal fibres. *International speaker:* • *Robert Dirksen, University of Rochester Medical Center, NY (*Also presenting as an ASB Plenary speaker). One is Enough: RyR1 Allele-Specific Gene Silencing in Mouse Models of MH and CCD
Joint ASB and AuPS	Imaging and dynamic microscopy (imaging of biological and biophysical processes) Chair: Pierre Moens, University of New	• Leann Tilley, La Trobe University, Imaging malaria parasite-infected erythrocytes using new high resolution modalities. • Alpha Yap, Inst for Molecular Bioscience, University of Queensland, Cadherin dynamics and the cytoskeleton.

	England	(• TBA: Talk to be selected from abstracts.) *International speakers:* • *Enrico Gratton, University of California, Irvine*. Detecting stem cell differentiation using FLIM by the phasor approach. • *Michelle Digman, Optical Biology Core Facility, UCI*. Molecular transport in cells by the pair correlation fluctuation method.
Joint ASB and AuPS	Calcium signalling Chairs: Grigori Rychkov, Physiology, Uni Adelaide, and Greg Barritt, Medical Biochemistry, Flinders University	*International speakers:* • *Richard Lewis, Stanford University, California*. Title TBA • *Oleg Gerasimenko, School of Biosciences, Cardiff University, UK*. Calcium regulation of apoptosis in pancreatic acinar cells. • *Andrew L. Miller, Hong Kong*. The application of complementary luminescent and fluorescent imaging techniques to visualize nuclear and cytoplasmic Ca^{2+} signaling during in vivo differentiation of slow muscle cells in zebrafish embryos.
Joint ASB and AuPS	Lipid metabolism and disease: new insights from the lab to the clinic Chair: Matthew Watt, Dept of Physiology, Monash University	• Matthew Watt, Monash University. Circulating ceramides, inflammation and insulin resistance. • Graham Lancaster, Baker IDI. Dual but opposing roles for dsRNA-dependent protein kinase (PKR) in obesity and inflammation. • Bronwyn Kingwell, Baker IDI. High density lipoproteins, diabetes and vascular function. • Leonie Heilbronn, University of Adelaide. Calorie restriction vs. exercise: the fitness vs. fatness debate rages.
Joint ASB and AuPS	Ion channel modulation by peptide toxins Chairs: Ray Norton, Monash Institute of Pharmaceutical Sciences, and David Adams, Health Innovations Research Institute, RMIT University	• Glenn King, University of Queensland. Title TBA • Mary Chebib, University of Sydney. Title TBA • David Adams, RMIT University. Title TBA • Ray Norton, Monash University. Title TBA *International speaker:* • *Bob French, University of Calgary Canada*. Title TBA
Joint ASB and AuPS	Molecular physiology and membrane dynamics Chairs: Jens Coorssen, School of Medicine, University of Western Sydney, and Peter Thorn, School of Biomedical	• Frances Separovic, University of Melbourne. Membrane protein structure and function. • Boris Martinac, Victor Chang Cardiac Research Institute, Sydney. Molecular mechanisms of mechanosensation. • Ian Gibbins, Flinders University. Molecules in motion: imaging peptides, their

	Sciences, University of Queensland	receptors and diffusion models. • Brett Garner, University of Wollongong. Targeting membrane lipids to modulate amyloid precursor protein processing. *International speaker:* • *Paul Dietl, University of Ulm, Germany*. Molecular control of surfactant secretion in type 2 alveolar cells.
AuPS	Physiology education. Chairs: Simon Potocnik, Medical Sciences, RMIT University; and Ann Sefton, Medicine, University of Sydney	• keynote speaker TBA- *Inaugural AuPS, Excellence in Physiology Education, Michael Roberts medallist*. • Michael Nott, RMIT University. Strategies to enhance engagement in on-line health science courses. • Richard Guy, RMIT University. The KISS approach. How to develop an effective self directed e-learning application. • David Saint, University of Adelaide. Lecture Attendance, Learning Style and Assessment Outcome in Physiology Students • Steven Wiederman, University of Adelaide. The Human Physiology Writing Centre: Mentors helping students with their writing tasks
AuPS	Regulation of metabolic balance through co-ordination of central and peripheral signalling. Chair: Chen Chen, Professor and Chair in Endocrinology, School of Biomedical Sciences, University of Queensland	• Michael Cowley, Monash University. Control of energy balance by nutrient sensing neurons. • Frederik Steyn, University of Queensland. The importance of peripheral signals in regulating central control of GH secretion. *International speaker:* • *Jacque Epelbaum, INSERM-Molecular Neuroendocrinology Unit, Paris France*. Regulation of hypothalamic GHRH neuronal action by metabolic regulatory neurotransmitters
AuPS	New insights into the molecular architecture of the heart and their implications for heart disease. Chairs: Yue-kun Ju and David Allen, University of Sydney	• Diane Fatkin, University of New South Wales. Mechanisms of contractile dysfunction in lamin A/C-deficient hearts. • Angela Dulhunty, John Curtin School of Medical Research ANU. Proteins in the lumen of the SR determine cardiac RyR channel activity and structure of Ca^{2+} release units. • Yue-kun Ju, University of Sydney. Distribution and functional role of IP3R receptors in mouse sino-atrial node. *International speakers:* • *Mark Boyett, University of Manchester, UK*. The molecular architecture of the heart's conduction system in health and disease. • *Mark Cannell, University of Auckland, NZ.* A new twist in cardiac muscle:

		dislocated and helicoid arrangements of myofibrillar z-disks in mammalian ventricular myocytes.
AuPS	Emerging leaders in developmental physiology. Chairs: Caroline McMillen, University of South Australia; and Helena Parkington, Monash University	• Karen Moritz, University of Queensland. Kidney development and regulation of blood pressure. • Tim Moss, Monash University. Inflammation and lung development. • Janna Morrison, University of South Australia. Early origins of cardiovascular disease: The heart of the matter. • James Armitage, Monash University. Developmental origins of obesity related hypertension. • Marianne Tare, Monash University. Early life environments and programming of the vascular phenotype
AuPS	Cardiovascular stress, disease and Ca^{2+} management. Chairs: Lea M D Delbridge, University of Melbourne, and David Saint, University of Adelaide.	• Derek Laver, University of Newcastle. Cardiac SR Ca^{2+} release channels and adrenergic stimulation. • James R Bell, University of Melbourne. Cardiac ischemic stress: Ca^{2+} and sex scenarios. • Marie L Ward, University of Auckland, NZ. Cardiomyopathies: When is Ca^{2+} the culprit? • David P Wilson, University of Adelaide. Store-operated Ca^{2+} channels and vascular responsiveness.
AuPS	Fatigue mechanisms limiting exercise performance Chair: Prof Michael McKenna, Victoria University	• David Bishop, Victoria University. Fatigue during intermittent exercise. *International speaker:* • *Markus Amann (University of Utah, USA)*. Neuromuscular fatigue: interactions between central and peripheral factors.
AuPS	Skeletal muscle ROS: the good, the bad and the, well it kinda depends Chair: Glenn McConell, Victoria University	• Tony Tiganis, Monash University. Skeletal muscle H_2O_2 and insulin sensitivity. • David James, The Garvan Institute. The role of ROS in insulin resistance. • Graham Lamb, La Trobe University. Effects of ROS /glutathionylation /S-nitrosylation on Ca-sensitivity and force, a balancing act. • Glenn McConell, Victoria University. Skeletal muscle ROS and glucose uptake during contraction.