



Physiology and Pathophysiology 2018: Molecules, Cells, Organs and Systems

Tuesday 6th and Wednesday 7th March 2018

(Hadyn Ellis Building, Cardiff University, Maindy Road, Cathays, Cardiff CF24 4HQ, UK)

Organizing Committee: Julia Gerasimenko (Cardiff University), Oleg Gerasimenko (Cardiff University) and Anant Parekh (University of Oxford)

Tuesday 6th March

09:00-09:05 Welcome and Introduction: **Jim Murray** (Cardiff University)

Session 1: General Physiology/Pathophysiology

Chair: **Jim Murray** (Cardiff University)

09:05-09:35 **Ole Petersen** (Cardiff University) Developments in physiology and pathophysiology over the last 50 years: a personal account

09:35-09:55 **Denis Noble** (University of Oxford) Schrödinger's error: How physiology harnesses stochasticity and generates function

09:55-10:05 Discussion

10:05-10:25 **Valerie O'Donnell** (Cardiff University) Exploring the lipidome of innate immune cells and blood clots reveals communication networks

10:25-10:35 Discussion

10:35-10:45 **Angharad Jones** (Cardiff University) Watching the flowers grow: modelling cell division and tissue growth in plants

10:45-10:50 Discussion

Coffee break

Session 2: New insights into intracellular calcium signalling

Chair: **Trevor Dale** (Cardiff University)

11:10-11:30 **Tullio Pozzan** (Padua University) Mitochondrial Ca²⁺ handling in cardiac cells: new findings and open questions

11:30-11:40 Discussion

11:40-12:00 **Andras Spät and Gergő Szanda** (Semmelweis University, Budapest) Interaction between Ca²⁺ and cAMP within mitochondria

12:10-12:20 Discussion

12:20-12:40 **Anant Parekh** (University of Oxford) Signalling to the nucleus by calcium microdomains near open Orai1 calcium channels

12:40-12:50 Discussion

LUNCH

Chair: **Dipak Ramji** (Cardiff University)

13:50-14:10 **Patrik Rorsman** (University of Oxford) Insulin, the fusion pore and diabetes

14:10-14:20 Discussion

14:20-14:40 **Karl Swann** (Cardiff University) Ca²⁺ oscillations at fertilization in mammalian eggs

14:40-14:50 Discussion

14:50-15:10 **Maïke Glitsch** (University of Oxford) Translating tissue stiffness into intracellular Ca²⁺ signals

15:10-15:20 Discussion

Coffee break

Session 3: Physiology and Pathophysiology of Epithelia

Chair: **David Lloyd** (Cardiff University)

15:40-16:00 **Dennis Brown** (Harvard University Medical School, Boston) Understanding aquaporin-2 trafficking to address water balance disorders: new insights

16:00-16:10 Discussion

16:10-16:30 **Kim Barrett** (University of California, San Diego) Pathophysiology of intestinal fluid secretion – new insights from enteroid models

16:30-16:40 Discussion

Chair: **Clare Hughes** (Cardiff University)

16:40-17:00 **Markus Lerch** (University of Greifswald) Crosstalk between acinar and inflammatory cells in pancreatitis

17:00-17:10 Discussion

17:10-17:30 **Julia Gerasimenko** (Cardiff University) Pancreatic stellate cells in physiology and pathology of exocrine pancreas

17:30-17:40 Discussion

Wednesday 7th March

Chair: **Vic Duance** (Cardiff University)

09:00-09:20 **Peter Hegyi** (University of Pecs) The importance of energy in acute pancreatitis: from mitochondrial injury to patient care

09:20-09:30 Discussion

09:30-09:50 **Alexei Tepikin** (University of Liverpool) Calcium signalling and its functional consequences in pancreatic acinar cells and pancreatic cancer cells

09:50-10:00 Discussion

10:00-10:20 **Oleg Gerasimenko** (Cardiff University) Mechanism of Asparaginase-induced Acute Pancreatitis

10:20-10:30 Discussion

Coffee break

Chair: **Bruce Caterson** (Cardiff University)

10:45-11:05 **Robert Sutton** (University of Liverpool) Accelerating Drug Discovery and Development for Pancreatitis

11:05-11:15 Discussion

11:15-11:25 **Shuang Peng** (Cardiff University) In vivo studies of Asparaginase induced pancreatic acinar pathophysiology

11:25-11:30 Discussion

Session 4: Physiology and Pathophysiology of Brain Function

Chair: **Alun Davies** (Cardiff University)

11:30-11:50 **Arthur Konnerth** (Technical University Munich) Calcium signalling in central neurons

11:50-12:00 Discussion

12:00-12:20 **Annette Dolphin** (UCL, London) Visualisation of neuronal voltage gated calcium channels

12:20-12:30 Discussion

12:30-12:50 **Carl Petersen** (EPFL, Lausanne) Neural circuits for goal-directed learning

12:50-13:00 Discussion

Lunch

Chair: **Ros John** (Cardiff University)

13:40-14:00 **Denis Burdakov** (ETH, Zürich) Deconstructing and controlling the hypothalamus

14:00-14:10 Discussion

14:10-14:30 **Alex Verkhratsky** (Manchester University) Redefining neuron-centrism: principles of astroglipathology

14:30-14:40 Discussion

14:40-15:00 **Vincenzo Crunelli** (Cardiff University) Dynamics and Function of Thalamic Oscillations of Low-vigilance States and Epilepsy

15:00-15:10 Discussion

15:10- 15:20 **Tatyana Shelkownikova** (Cardiff University) Understanding the role of an abundant long non-coding RNA NEAT1 in the brain

15:20-15:25 Discussion

15:25-15:30 Conclusion

Tea

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