

3rd Optogenetics Australia Meeting

23rd-24th February, 2023

Alere - Registry Road, The Hub, Level 2
Bedford Park SA 5042, Flinders University

Sponsored by



Australasian NeuroGastroenterology
& Motility Association Inc (ANGMA)



Organisers: Nick Spencer, Wendy Imlach & Harald Janovjak

PROGRAM - 3rd Optogenetics Australia Meeting

23rd-24th February, 2023 - Flinders University, Bedford Park, South Australia

Thursday, February 23rd, 2023

9:10am Welcome and Acknowledgement of Country

Nick Spencer (Flinders University)

SESSION 1 - Non-Neuronal Optogenetics

Chair: **John Lin** (University of Tasmania)

9.15am Keynote lecture (virtual): **Chandra Tucker** (University of Colorado, USA)

Short invited talks (10 min talks, 5 min questions)

9:45am **Cedric Bardy** (SAHMRI, Flinders University)

“Electrophysiology of human neuronal models”

10.00am **Jessica Greaney** (Monash University)

“Optogenetically-controlled microtubule organisation in pluripotent cells”

DATA BLITZ (5 min talks, no questions)

10.20am **Christina Gangemi** (Monash University)

“Optical approaches to promote beta cell regeneration”

10.25am **Dmitry Ovinnikov** (Florey Institute, Victoria)

“Development of a live calcium reporter toolset for use in human pluripotent stem cell-based models”

10.30am **Anna Leopold** (University of Helsinki)

“Engineering receptor tyrosine kinases activated with far-red light: a generalized approach”

10.35am *Morning tea*

SESSION 2 – Neuronal Optogenetics

Chair: **Brett Graham** (The University of Newcastle)

11:00am Invited Talk: **Lucy Palmer** (The Florey Institute)

“Probing and manipulating neural activity during sensory association”

Short invited talks (10 min talks, 5 min questions):

11:30am **Lindsea Booth** (The Florey Institute)

“Optogenetic control of vagal efferents in sheep”

11.45am **Bowen Dempsey** (Macquarie University)

“Genetic dissection of oromotor circuits”

12.00pm **Rachael Richardson** (Bionics Institute)

“Hybrid (electrical and optogenetic) stimulation”

DATA BLITZ (5 min talks, no questions)

- 12.15pm **Tyler Brown** (University of Newcastle)
"Using optogenetics to study mouse spinal projection neurons: connecting the superficial and deep dorsal horns"
- 12.20pm **Chi Kin Ip** (Garvan Institute)
"Optogenetic activation of the lateral habenula Npy1r circuit control palatable food Consummatory Behaviour"
- 12.25pm **Asheeta Prasaad** (University of Sydney)
"Bidirectional Optogenetic Modulation of the Subthalamic Nucleus in a Rodent Model of Parkinson's Disease"
- 12.30pm *Lunch*

SESSION 3 - Novel Techniques in Neurogenetics

Chair: **Youichirou Ootsuka** (Flinders University)

- 1.30pm Keynote lecture: **Akihiro Yamanaka** (Nagoya University, Japan)
"Optogenetic intervention reveals physiological role of orexin neurons activity in sleep/wakefulness regulation"

Short invited talks:

Chair: **Nick Spencer**

- 2:00pm **Andrew Efimov** (Northwestern University, USA)
"Wireless optogenetic tool development for visceral organs"
- 2.15pm **Marie-Eve Paquet** (Laval University, Canada)
"Novel viral engineering approaches for the development of optogenetic tools"
- 2:30pm **Alex Reichenbach** (Monash University)
"Optogenetic control of AGRP neurons to teach avoidance behaviour"
- 2:45pm **Itia Favre-Bulle** (University of Queensland)
"Development of novel optogenetic control of zebrafish"

DATA BLITZ (5 min talks, no questions)

- 3:05pm **Chantel Mastos** (Monash University)
"Developing an optogenetic system to shine a light on intracellular GPCR signalling"
- 3:10pm **Elise Ajay** (Bionics Institute, Melbourne)
"Opsin kinetics impacts the temporal precision of auditory nerve responses to combined optogenetic and electrical stimulation"
- 3:15pm *Afternoon tea*

Chair: **Yves De Koninck** (Laval University, Canada)

3:35pm Keynote lecture (virtual): **Alexander Gottschalk** (Goethe U., Germany)
"Optogenetic voltage clamp and optical analysis of electrical signaling in neural circuits driving behaviour"

4.15pm *Conclusion of presentations*

6.00pm *Conference dinner in Glenelg, SA ("Luciano's on the Marina")*

Friday, February 24th, 2023

Chair: **Nick Spencer** (Flinders University)

9:30am Invited Talk: **Guosong Hong** (Stanford University, USA)
"Seeing the sound: new optical and ultrasound methods for neuroscientists"

SESSION 4 - Application of Latest Techniques in Neurogenetics I

Chair: **Wendy Imlach** (Monash University)

10:00am Invited talk: **Yves De Koninck** (Laval University, Canada)
"Probing primary afferent terminal physiology by optogenetic sensors" and "Micro-optrodes for single cell optogenetics in vivo"

Short invited talks (10 min talk, 5 min questions):

10:35am **Elena Bagley** (University of New South Wales)
"Endogenous opioids control amygdala neural circuits and learning during opioid withdrawal"

10:50am **Aung Aung Kywe Moe** (The University of Melbourne)
"Characterization of mouse airway innervation with optogenetic vagal stimulation and neuroanatomical investigation"

11:05am **Jing Feng** (Shanghai Institute of Materia Medica, China)
"Optogenetic control of skin afferents"

11.20am **Joanna Yau** (University of New South Wales)
"Temporal, cell-type and projection specific targeting of BLA neuronal subtypes during fear learning"

11.35pm **David Tsai** (University of New South Wales)
"Nanoscale and microelectronic tools for multi-scale neuroscience and sensory therapeutics"

DATA BLITZ (5 min talks, no questions)

11.55am **Fiona Knapman** (Neura, University of New South Wales)
"Direct optogenetics for obstructive sleep apnea"

12:00pm **Ajmal Azees** (Bionics Institute, Melbourne)
"Optogenetic and Electrical Stimulation: Comparison of Spread of Activation and Interaction between Channels in the Mouse Cochlea"

12:05pm Lunch

SESSION 5 - Application of Latest Techniques in Neurogenetics II

Chair: **Harald Janovjak** (Flinders University)

1.10pm Invited Talk: **Richard Kramer** (University of California, Berkley, USA)
"New strategies for preserving and reviving sight in retinal degeneration"

Short invited talks (10 min talk, 5 min questions):

Chair: **Stuart Mazzone** (University of Melbourne)

1:45pm **Stuart McDougall** (Florey Institute, Australia)
"Using optogenetics to define how vagal signals modulate interoceptive linked behaviour"

2:0pm **Youichirou Ootsuka** (Flinders University, Australia)
"The role of serotonin and dopamine systems in autonomic physiological function"

2:15pm **Philip Ryan** (Florey Institute, Victoria)
"Feeding signals inhibit fluid-satiation signals in the parabrachial nucleus to increase intake of highly palatable, caloric solutions"

DATA BLITZ (5 min talks, no questions)

2:30pm **Rebecca Power** (University of Sydney)
"Neuronal Circuits Linking Pain and Wakefulness"

2:35pm **Mathew Kenna** (University of Queensland)
"Optogenetic manipulation of fear engrams provides insights into memory consolidation"

2:40pm **Lincon Stamp** (University of Melbourne)
"Cell therapy for the gut – using optogenetics to demonstrate functional integration of new nerves"

2:45pm *Afternoon tea*

3.15pm Keynote Lecture: **Ofer Yizhar** (Weizmann Institute, Israel)
Chair: **Harald Janovjak** (Flinders University)
"Optogenetic control of long-range neural communication"

4:00pm *Conclusion of presentations*

4.15pm *Group photo*

4:20pm *South Australian Wine & Canapes,
Best Talk Award (announced by Wendy Imlach)*

5:20pm *End*