



NEUROSCIENCE & BEHAVIOURAL DISORDERS



NBD Retreat 2018 3 December 2018 9:00am to 8:30pm NUSS, Kent Ridge Guild House





Scan me to view the NBD retreat programme booklet

Schedule for the day

Time	Event
9:15am – 10:10am	Registration and morning tea
10:10am – 10:20am	Introduction to retreat by Dr. Joshua J Gooley
10:20am – 10:30am	Welcome address by Dr. Zhang Su-Chun, Programme Director
10:30am – 10:45am	Imaging Synapses: From Molecule to Function Dr. Jun Nishiyama
10:45am – 11:00am	Sleep EEG changes in adolescents undergoing multiple nights of sleep restriction and recovery Dr. Ong Ju Lynn
11:00am – 11:15am	Targeting the coma in glaucoma Dr. Jonathan Crowston
11:15am – 11:30am	Introductory mindfulness training reduced pre-sleep cognitive arousal in a waitlist-control trial Dr. Julian Lim
11:30am – 11:45am	Molecular mechanisms of neural stem cell reactivation in Drosophila Mr. Huang Jiawen
11:45am – 12:00pm	The dynamics of Arc expression in neuronal networks Ms. Jiang Yuheng
12:00pm – 1:00pm	Lunch
1:00pm – 2:00pm	Keynote talk Signaling pathways regulating axon degeneration Professor Marc Freeman
2:00pm – 2:15pm	The association between vision and emotion Ms. Feng Yenju
2:15pm – 2:30pm	Postnatal TrkB ablation in neocortical interneurons induces social dominance in male mice Dr. Shawn Tan
2:30pm – 3:00pm	Data blitz
3:00pm – 3:30pm	Afternoon tea and poster session
3:30pm – 3:45pm	Predicting impaired driving performance Mr. Yeo Sing Chen
3:45pm – 4:00pm	A New Assay for Fly Feeding Dr. Xu Sangyu
4:00pm – 4:15pm	Influence of Alzheimer's disease and cerebrovascular disease on brain functional networks Ms. Joanna Chong
4:15pm – 4:30pm	The AMPK-PGC-1α axis in neuroprotection – Implications for energy deficits in Parkinson's disease Ms. Hang Liting
4:30pm – 5:00pm	Games
5:30pm	BBQ dinner

Welcome note

Welcome, fellow neuroscientists and friends, to our annual NBD retreat! The retreat has been made possible by the hard work of the organizing committee, to whom we are all much indebted: Joshua Gooley, Alison Ung, Joyceline Ng, Stephanie Ho, Shawn Tan, Eric Ng, Stanislav Ott and Mahekta Rajeshkumar Gujar.

Please enjoy the fun in meeting with new and old friends as well as discussing life and science!

Professor Zhang Su-Chun

Programme Director

Neuroscience and Behavioral Disorders Programme



NBD Retreat 2018: Keynote speaker

Marc Freeman is Director of the Vollum Institute. Freeman trained as a postdoctoral associate with Chris Doe at the University of Oregon from 1999–2004, studying Drosophila neurogenesis. He started his laboratory in the Department of Neurobiology at UMass Medical School in 2004. Freeman was selected as an Alfred P. Sloan Research Fellow (2005), and an HHMI Early Career Scientist (2009–2013), and he was an HHMI Investigator from 2013 to 2016, until he moved to the Vollum Institute in 2016.

Dr. Jun Nishiyama Assistant Professor Laboratory of Molecular Imaging and Neuropsychiatric Disorders



Title: Imaging Synapses: From Molecule to Function

Abstract:

Our brain functions depend on connections between billions of neurons. These connections or synapses are disrupted in many neuropsychiatric disorders. Here, I introduce tools to probe endogenous proteins and image signal transduction in single synapses. I will discuss how these techniques can help to understand molecular regulation of synapse.

Dr. Ong Ju Lynn Research Fellow Cognitive Neuroscience Laboratory Professor Michael Chee



Title: Sleep EEG changes in adolescents undergoing multiple nights of sleep restriction and recovery

Abstract:

Chronic sleep restriction is a public health epidemic, and this problem is particularly dire in East Asian adolescents such as those in Singapore. In experiments simulating a typical school week of 5 sleep-restricted (5h and 6.5h) and 2 recovery nights (9h), we examine how sleep EEG changes across the week compared to a group consistently obtaining 9h every night. We further discuss potential implications for longer-term sleep-restriction.

Dr. Jonathan Crowston Professor Visual Neurorecovery Laboratory



Title: Targeting the coma in glaucoma

Abstract:

We have developed a reversible injury model to examine the characteristics of injured non-functioning neurons in the optic nerve and interrogate means for improving functional recovery and restoration of function synapses. Whereas advancing age and a western diet can impair functional recovery, diet restriction and exercise accelerate functional recovery and reduce neuronal death.

Dr. Julian Lim Assistant Professor Neuroergonomics and Cognition Laboratory



Title: Introductory mindfulness training reduced pre-sleep cognitive arousal in a waitlist-control trial

Abstract:

We measured the effects of a 4-week mindfulness course on sleep quality in 96 participants in a waitlist-control design. Subjective sleep quality improved in both groups, with no statistical difference between groups. Pre-sleep cognitive arousal was significantly reduced in the treatment group only. Change in objectively measured time awake during the night was also statistically significant.

Mr. Huang Jiawen PhD Student Laboratory of Neural Stem Cells Associate Professor Wang Hongyan



Title: Molecular mechanisms of neural stem cell reactivation in Drosophila

Abstract:

In the Drosophila brain, InR/PI3K/Akt pathway triggers neural stem cell (NSC) reactivation. We identified heat shock protein 83 (Hsp83/Hsp90), a molecular chaperone, is both necessary and sufficient for NSC reactivation by physically associating with InR and promoting its activation in larval brains in the presence of dietary amino acids.

Ms. Jiang Yuheng PhD Student Laboratory of NMDA Receptor and Neuronal Networks Associate Professor Antonius Van Dongen



Title: The dynamics of Arc expression in neuronal networks

Abstract:

Arc/Arg3.1 is an immediate-early gene important for long-term memory formation which functions as a marker for the memory engram. To study the dynamics of Arc expression in neuronal networks, we established the time course and localisation of Arc after network activation. Secondly, we determined the links between network connectivity and Arc expression in individual neurons.

Keynote talk

Professor Marc Freeman Director and Senior Scientist, Vollum Institute



Title: Signaling pathways regulating axon degeneration

Abstract:

Nervous system injury can have devastating long-term effects on neurophysiology, but signaling pathways that regulate nervous system responses to injury remain poorly defined. We use Drosophila and mice to define conserved molecular signaling pathways that mediate injury signaling in the nervous system. This presentation will cover our current understanding of pathways that drive axon degeneration, neuron-glia signaling during trauma, and how injury signals spread in the nervous system. Ms. Feng Yenju PhD student Laboratory of Brain and Consciousness Assistant Professor Brown Hsieh



Title: The association between vision and emotion

Abstract:

Growing evidence suggests that the detection of certain emotions is associated with perception of specific visual features. However, it is still not clear whether the observed association is an automatic process that can occur subliminally. Thus in the current study, a series of experiments were carried out to address this issue. Relevant results may provide a ground stone for the measurement of emotional intentions.

Dr. Shawn Tan Research Fellow Molecular Neurophysiology Laboratory Associate Professor Shawn Je



Title: Postnatal TrkB ablation in neocortical interneurons induces social dominance in male mice

Abstract:

Our ability to reason, feel, and socialise relies on the development of a tight balance between inhibition and excitation within cortical circuits. We show that transgenic mice with deletion of BDNF/TrkB signalling from neocortical inhibitory neurons exhibit social dominance and decreased inhibition within the prefrontal cortex, a key region regulating social behaviour. Mr. Yeo Sing Chen PhD Student Chronobiology and Sleep Laboratory Associate Professor Joshua Gooley



Title: Predicting impaired driving performance

Abstract:

Drowsy driving is a major cause of vehicular accidents. We found that baseline measures of reaction time performance and heart rate variability carry information about individual differences in drowsiness-related driving events following exposure to total sleep deprivation. Our results have implications for driver safety.

Dr. Xu Sangyu Research Fellow Laboratory of Vinegar fly Behavioural Models Assistant Professor Adam Claridge-Chang



Title: Espresso: A New Assay for Fly Feeding

Abstract:

Food seeking is essential to maintaining energy balance. We present a new assay, *Espresso*, which utilises machine vision to measure moment-to-moment food consumption and locomotion activities in the fruit fly. We use *Espresso* to investigate the role that serotonin neurones play in food seeking behaviour.

Ms. Joanna Chong PhD Student Laboratory of Multimodel Neuroimaging in Neuropsychiatric Disorders Assistant Professor Helen Zhou



Title: Influence of Alzheimer's disease and cerebrovascular disease on brain functional networks

Abstract:

Cerebrovascular disease (CeVD) frequently co-occurs with Alzheimer's disease (AD), however little remains known about the impact of co-occurring AD and CeVD pathologies on brain functional network changes. Here we present evidence supporting the divergent effects of AD and CeVD pathologies on intrinsic connectivity networks in clinical and prodromal dementia patients.

Ms. Hang Liting PhD Student Neurodegeneration Research Laboratory Associate Professor Lim Kah Leong



Title: The AMPK-PGC-1α axis in neuroprotection – implications for energy deficits in Parkinson's disease

Abstract:

In mammalian PD-affected brain region, AMPK-PGC-1 α axis is physiologically upregulated and downregulated with age or in Parkin/PINK1-deficient brains. Importantly, ablation of AMPK function in mice alters locomotor behavior and increases susceptibility to 6-OHDA toxin-induced dopaminergic neurodegeneration, suggesting that the AMPK-PGC-1 α axis may be important for the maintenance of neuronal energy homeostasis.

Posters submission

No.	Name	Poster title
1	Shaun Yee	6-Month Infants' Sleep: An Analysis on Total Sleep Time,
		Activity Level and Light Level
2	James Cousins	Split sleep is superior to consolidated nocturnal sleep for
0	D. L. Martin Diverse	the retention of factual knowledge
3	Rukmini Dhara	Circadian regulation of breath alcohol concentration
4	Christina Erwin	Sleep Duration and Health Related Outcomes in Adolescents
5	Ruth Leong	The effects of sleep on prospective memory: a systematic review and meta-analysis
6	Stijn Massar	Time-on-task as an effort-related cost: a simultaneous fMRI and pupillometry study
7	Masahiro Fukuda	In vivo hippocampus CA1 imaging with 2-photon microscopy
8	Deng Qiannan	Tumour suppressor Parafibromin/ Hyrax governs cell polarity of neural stem cells
9	Elaine van Rijn	Sleep and memory consolidation of reward-motivated encoding
10	Chun Siong Soon	The haemo- and neuro-dynamics of dozing off
11	Zixin Yong	Motor imagery task facilitates awareness detection in patients with disorders of consciousness
12	Jurga Mituzaite	Identification of novel treatments for epilepsy
13	Stanislav Ott	Arousal is a precondition for odor avoidance learning in Drosophila
14	Liwen Zhang	BOLD signal variability changes in the default and salience networks in amnestic cognitive impairment and Alzheimer's disease and their associations with cognitive decline
15	Ji Fang	Cortical and white matter abnormalities in early- and late- onset Alzheimer's disease
16	Joses Ho	Beyond P Values: Data Analysis with Bootstrap Estimation
17	Siwei Liu	Cognitive and Brain Network Dedifferentiation in Individuals at Ultra-High Risk for Psychosis
18	Ken Wong	Resting-state functional connectivity changes following nonpharmacological interventions for mild cognitive impairment: preliminary results from the MEDIC Study

Special thanks to:



SfN Singapore Chapter for their kind sponsorship for our retreat prizes.

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