Institute of Molecular and Cell Biology
A*STAR

SEMINAR ANNOUNCEMENT

We would like to invite you to attend this seminar hosted by A/Prof. Adam Claridge-Chang:

Date: 6 December 2018, Thursday
Time: 11:00AM – 12:00PM
Venue: Level 3, IMCB Seminar Room 3-46, Proteos, Biopolis

Speaker: Dr. Richard Lonsdale, Department of Physiology, Anatomy and Genetics, University of Oxford, England
Title: Is synaptic potentiation required for associative learning in adult fruit fly?

Drosophila melanogaster (fruit fly) learns to associate a specific odour with an unpleasant experience, and avoid that odour in the future. These memories reside in the fly mushroom body (MB), where odour-signalling Kenyon cells (KCs) excite mushroom body output neurons (MBONs) that drive approach behaviour. Dopaminergic neurons (DANs) respond to an unpleasant experience (e.g. electric shock), releasing dopamine that results in depression of KC-MBON synapses for recently activated KCs. The associated odour drive to approach MBONs is reduced, thus increasing avoidance of that odour. Clearly synaptic depression is crucial for associative learning in drosophila. The role ofsynaptic potentiation, however, is less clear. We have constructed a computational model of the MB lobe responsible for short term memories, based upon recent experimental data that sheds light on the mechanics of this circuit including the role of synaptic potentiation. The model demonstrates that synaptic potentiation enables the fly to acquire and prioritise new memories whilst retaining older memories. Application of the model, to ten different aversive training protocols, shows that it can also explain a surprising number of behavioural results.

Biography:
Richard studied mathematics at Oxford University, and completed his PhD in Plasma Physics at the University College of North Wales. He spent the next 17 years in industry, developing computational fluid dynamics software, followed by a further 17 years in various business management roles. Retiring from business in November 2017, Richard wanted to return to his true love: science. In particular, he was excited by the potential of computational modelling in neuroscience. Richard joined the Centre for Neural Circuits and Behaviour, at Oxford University's Department of Physiology, Anatomy and Genetics, where he has been looking at learning and memory in fruit fly.

ALL ARE WELCOME *(No registration required)*

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