The Singapore Bioimaging Consortium (SBIC)
presents a seminar on

"Early Electrophysiological and Behavioural changes in the 3xTg mouse model for Alzheimer's disease"

Speaker: **Dr John Gigg**
Lecturer
University of Manchester
Host : **Prof Malini Olivo**
Date : **Wednesday, 21 November 2018**
Time : **2.00pm – 3.00pm**
Venue : **SBIC Seminar Room**
11 Biopolis Way
Level 2, Helios Building, Singapore 138667
(Please enter via Level 1)

Abstract

Alzheimer's disease (AD) is characterised by the accumulation of pathological changes across the brain that are associated with specific memory deficits. One of the earliest defining symptoms of cognitive decline in AD is a deficit for the retrieval of memories about life events (so-called episodic memory). Episodic memories are encoded within the hippocampal formation, which is a major and early target of AD pathology. In order to understand how AD pathology impacts hippocampal synaptic function and cognitive loss we have used the triple-transgenic mouse model for AD (the 3xTgAD mouse), which expresses the main pathological hallmarks of human AD. We first used the 'What-Where-Which' (WWWhich) test to show that this model expresses a complete episodic-like memory deficit by 4-5 months of age, that is, well before the appearance of extracellular amyloid plaques or tau tangles, supporting the validity of the model. We next asked whether this was associated with synaptic changes. We recorded from dentate gyrus and CA1 regions of the dorsal hippocampal formation in anaesthetised 3xTgAD mice whilst stimulating their main synaptic input from entorhinal cortex. We found that, whilst circuit connectivity was relatively intact, short-term synaptic hyper-excitability was clearly evident by 4-5 months, consistent with the age at which we saw a clear WWWhich deficit. In my talk I will summarise these findings and present our unpublished data regarding synaptic changes at other points within the 3xTgAD hippocampal formation. A particular focus will be on the timing of these changes relative to each other and whether changes are similar between dorsal and ventral hippocampal formation.

About the Speaker

Dr John Gigg is a lecturer within the Division of Neuroscience and Experimental Psychology of the Faculty of Biology, Medicine and Health at the University of Manchester. He obtained his PhD in Biology from The Open University, UK in 1991, where he studied the neural correlates of memory formation in the chick with Prof

Steven PR Rose. Dr Gigg then took post-doctoral appointments, firstly in the Brain Research Institute at UCLA (USA), then the Clinique Neurologique at the University of Rennes II (France), the Department of Psychology at Trinity College Dublin (Ireland) and finally the Department of Psychology at the University of Newcastle (UK) before taking up his first permanent academic position at Manchester in late 2002. His research interests in the neurobiology of the hippocampal formation have broadened in the past few years to include pre-clinical models of neuropsychiatric diseases and his lab is now associated with the B-Neuro CRO at Manchester (b-neuro.com).

--- Admission is free and all are welcome ---