The Singapore Bioimaging Consortium (SBIC)
presents a seminar

on

"Neurovascular function in Pathology, does the BOLD signal always reflect changes in Neuronal Activity?"

Speaker: **Dr Jason Berwick**
Senior Research fellow
University of Sheffield, UK
Date : **Wednesday, 7 Aug 2013**
Time : **11.00am – 12.00pm**
Venue : **SBIC Seminar Room, 11 Biopolis Way**
Level 2, Helios Building
Singapore 138667
(Please use Level 1 entrance)

Abstract

Functional magnetic resonance imaging (fMRI) has revolutionized the field of cognitive neuroscience by increasing the ability to probe the workings of the human brain. However, it does suffer from a limitation that it is only measuring a secondary hemodynamic marker of neural activity termed the blood oxygenation level dependent (BOLD) response. A complete understanding of the BOLD signal source with regard to metabolism and neural activation is still lacking and is of critical importance especially as it is being used as a biomarker in many disease states such as dementia. There is a distinct possibility that BOLD signals in disease may not be driven entirely by neural activation but result as a consequence of a perturbed vascular system. This has implications not only for task evoked BOLD studies but spontaneous connectivity research. In this talk, he will present a series of experiments investigating the neural and hemodynamic signal sources of the negative BOLD signal. He will explore how non-neuronally driven BOLD signals could be generated and show some initial results from pilot experiments aimed at developing a mouse model for neurovascular research.

About the Speaker

Dr Jason Berwick is a Senior Research fellow at the department of Psychology, University of Sheffield. He graduated with a first class honours degree in Anatomy and Cell Biology in 1995. He then began a PhD under the guidance of Prof Mayhew to develop optical imaging techniques to measure brain activity. Following post doctoral work in the Mayhew laboratory he was awarded a permanent Research Fellow position to manage the group's new 7T animal MRI facility in 2007. He was also awarded a prestigious MRC new investigator award in 2007 to develop high resolution optical and MRI methods to advance the understanding of neurovascular

coupling. Dr Berwick's current grant income total is £4.1M of which £1.6M is as Principal investigator. The first grant is a 3 year grant from the Wellcome Trust, which started in March 2011 (£529K). He is leading an international collaboration between the University of Sheffield and Cornell Weil Medical College in New York to investigate neurovascular coupling in Epilepsy with a view to improving surgical outcomes in human patients. A second grant started in July 2011 and is a 3 year MRC grant (£655K), in collaboration with Oxford University. The funded work will investigate the neural and hemodynamic signal sources of local reductions in the fMRI signal. Reduced fMRI signals are now being used as a biomarker of several neurological diseases; consequently, it is extremely important to understand what neural and hemodynamic changes are responsible. Dr Berwick is also a section leader of the neuroimaging component and co-investigator on a University wide EPSRC nanotechnology grant (£2.5M).

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