

Friday June 20th, 2008

4-5pm, Elizabeth Burchill Room Building 68, Clayton Campus

Dr. Ben Inglis, Facilities Manager, Brain Imaging Center (University of California, Berkeley)

A/Prof. David Liley, Brain Sciences Institute (Swinburne University of Technology)

**“Multidisciplinary Research and Platforms
for
Imaging and Diagnostics”**

Recent advances in technology have provided exciting multidisciplinary research opportunities that combine biology with physics, mathematics and engineering. The strategic, collective use of these (once disparate) disciplines will achieve benefits in disease treatment. The challenge for universities, however, is to determine how to best manage researchers and resources to facilitate multidisciplinary research, and to bring together islands of knowledge, such that the whole is greater than the sum of the parts.

One of the most significant challenges in multidisciplinary research, and platform sharing, arises from attempts to better image the function of the brain. The outcomes of such research will advance human understanding, and provide a basis for translational research, leading to new tools for clinical practice.

The objective of this seminar is to provide two examples that highlight the challenges and opportunities associated with multidisciplinary research involving biology, physics, mathematics and engineering.

- (i) *Assembling and Managing a Multidisciplinary Team*
The first example involves the mathematical modelling of the brain's electrical activity (EEG) and the conversion of this fundamental research, through engineering research principles, into diagnostic approaches to monitoring brain function – leading to a commercial, clinical tool.

- (ii) *Clinical Research Drivers arising from a Multidisciplinary Environment*
Clinical researchers noted the need to combine multiple brain imaging modalities including MRI, EEG and MEG*. In pursuing such outcomes, physicists identified a novel technical solution not anticipated by clinicians, and then fed the solutions back to the clinicians to drive further research. Specifically, this research involves the development of a single instrument that facilitates combined MEG and MRI, with the potential to simultaneously record both the hemodynamic and electrical correlates of brain activity.

If correctly managed, multidisciplinary research can not only respond to clinical demands but also enhance clinical research.

*MEG: magneto-encephalography – measurement of extremely weak magnetic signals produced by the brain.

Refreshments and Informal Discussions to follow at 5pm.

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