QUT Health

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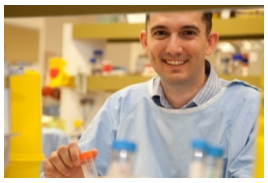
Research Services

Clinical Sciences

Confirmation Seminar by Nathan Tosh

Neuro Magnetic Resonance One and Two-dimensional In Vivo Spectroscopy at Three Tesla, for Evaluation of Human Development and Disease



WHO: Nathan Tosh

Course: Doctor of Philosophy

School: Clinical Sciences

Qualifications: B AppSc (MedRad), B PsychSc (Hons)

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DATE: Thursday 26 April 2018 **TIME:** 8-9am

WHERE: Translational Research Institute (TRI) Auditorium, 37 Kent St, Woolloongabba

PANEL MEMBERS:

Chair / Principal Supervisor	Prof Ross Young	Faculty of Health, QUT
Associate Supervisor	Prof Carolyn Mountford	Translational Research Institute (TRI)
External Supervisor	Prof Graham Galloway	Translational Research Institute (TRI)
School Nominee	Prof Vivienne Tippett	School of Clinical Sciences, Health, QUT
Internal Panel Member	Dr Davide Fontanarosa	School of Clinical Sciences, Health, QUT
External Panel Member	Prof Ian Brereton	Centre for Advanced Imaging, QUT

Abstract

In vivo Magnetic Resonance Spectroscopy (MRS) is a technique that allows the visualisation and measurement of chemicals, including lipids, metabolites and carbohydrates in the human brain in the region chosen to interrogate. The use of MRS clinically has been limited to 1D spectroscopy. As technology has improved the use of 2D Correlated SpectroscopY (COSY), a technique that has been used since the 70's on cell and animal models, has become viable for in vivo use. To date, in vivo 2D COSY of the brain has been used to investigate brain tumours and damage resultant to repetitive head trauma or blast injury. The aim of this thesis is to evaluate, and where necessary refine, 2D COSY protocols now possible because of recent hardware and software improvements. This thesis has a single theme applied to four human populations. The theme is: What is the role played by changes in neurochemistry in the human brain during adolescent development or in front-line defenders as a result of different trauma. Four different populations (developing adolescents, healthy adult controls, adults with PTSD and adults with blast injury) will be scanned using 2D COSY and neurochemical changes measured. All data will be analysed using existing techniques and new methods of analysis will be explored to ultimately enable 2D COSY to be utilized in the clinical environment.