

# PhD scholarship opportunity: Animal models of brain development assessed using MRI



We are seeking an enthusiastic and academically high performing student for a study seeking to investigate neurodevelopment across brain maturation in the mouse

Applications are invited for a PhD position at the Melbourne Neuropsychiatry Centre (MNC), University of Melbourne, Parkville. The MNC is a world-class research facility committed to investigate neuropsychiatric disorders and to facilitate clinical translation. The project is part of a larger initiative undertaken by researchers from the MNC, the Monash Institute of Pharmaceutical Sciences and the University of Queensland to map brain-structure-function relationships and molecular signatures across developmental stages, the impact of insults at each of the stages, and the appropriate choice of pharmacological intervention to ameliorate their impact.

As part of a multi-disciplinary team, the successful candidate will work on developing advanced neuroimaging techniques to study structural and functional brain connectivity in healthy and schizophrenic adolescent mice. The project will build on the human studies undertaken at MNC, which has led to novel animal models of neurodevelopment factors relevant to behaviour and cognition.

**Project Description:** Advanced Magnetic Resonance Imaging (MRI) methods are used to model and investigate microstructure, chemical composition and functional organization of the brain. The proposed project aims to leverage information from multiple MRI modalities, such as structural, diffusion and quantitative susceptibility mapping (QSM), to study neurodevelopment across brain maturation. Primary objectives are to investigate 1) developmental causes of neuropsychiatric disorders, 2) multimodal imaging biomarkers of cognitive deficits in developing brain, and 3) identification of altered brain connectivity and underlying biophysical mechanisms in diseased brain. In addition, the student will have access to behavioural and histological data collected concomitantly with imaging for validation and protocol optimisation.

**Available facilities:** The student will have access to state-of-the-art imaging and research facilities, including an ultra-high field 9.4T preclinical MRI scanner. The student will also have access to multimodal structural MRI data collected in mice from ages 4.5-14 weeks.

**Eligibility:** The applicant must fulfil the entry requirement for enrolment in a graduate research degree at The University of Melbourne. For information: <https://study.unimelb.edu.au/how-to-apply/graduate-research>

Ideally the applicant should have: 1) strong background in signal and image processing, 2) moderate to advanced programming skills, and 3) a degree in neuroscience/engineering. Familiarity with MRI acquisition and processing is desirable but not necessary.

For more information and expressions of interest,  
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