

Date of submission:
Project title:

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SINAPSE PhD Project Proposal Template for PhDs with Industry starting in 2010

PROJECT

Title:

Translating MR neuroimaging protocols from human to experimental models

Planned start date (month/year):

October 2010

SINAPSE Centre (i.e. primary university to which this studentship will be attached):

Edinburgh

University first supervisor: contact details

Name: Prof Ian Marshall
Department: Medical Physics
Address: Chancellor's Building, 49 Little France Crescent, Edinburgh, EH16 4SB
Email: ian.marshall@ed.ac.uk
Phone: 0131 242 6311

Second academic supervisor/ other university or other people in primary university involved with project

Prof Barrie Condon, Glasgow University (TBC)

Industry

Varian, Inc.

Industry main contact details

Name: Simon Pittard
Department: Director of Imaging
Address: European Centre of Excellence, 6 Mead Road, Oxford Industrial Park, Yarnton, Oxford OX5 1QU
Email: simon.pittard@varianinc.com
Phone: 01865 853800 ext 3849

Key Other Industry people involved with Project including Industry Supervisor (if different to Industry main contact above)

Dr Michael Gyngell, Industry Supervisor

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Likely background of suitable student (eg. Neuroscience, MR Physics, Chemistry, Engineering, Informatics, Psychology) and essential skills required prior to starting this PhD:

Essential: good first degree in physical science or engineering. Ability to work in a multidisciplinary environment spanning academia and industry, physics, engineering and medical sciences.

Desirable background: MR physics, imaging

Summary of proposed project (approximately 200 words):

This project will seek to translate advanced MR neuroimaging protocols from human to preclinical imaging, particularly those where the high field strength and small scale of preclinical imaging requires significant changes in parameters, or even a different type of sequence. Specific examples may include, but are not limited to, FLAIR, arterial spin labelling for estimation of cerebral blood flow, flow compensation, and functional MRI. The project will involve (i) observation of imaging in the human; (ii) assessment of the needs specific to preclinical imaging; (iii) development, implementation and refinement of the pulse sequences on the preclinical scanner; (iv) evaluation with in-vitro phantoms; (v) evaluation in preclinical studies as appropriate.

The student will benefit from the academic and clinical environment of the host university, coupled with the technical and engineering resources of the industrial partner Varian. A particular feature is that the student will spend several weeks based in Varian's imaging centre, and will have access to specialist scientists and engineers there.

The project outcome will be tested preclinical neuroimaging protocols that yield structural and functional information equivalent to the corresponding human protocols.

Key references (up to five):

Wegener S et al, Quantification of rodent cerebral blood flow (CBF) in normal and high flow states using pulsed arterial spin labeling magnetic resonance imaging. J Magn Reson Imag 2007; 26: 855-862.

Van der Linden A et al, Current status of functional MRI on small animals: application to physiology, pathophysiology, and cognition. NMR Biomed 2007; 20: 522-545.