University of Nottingham
Precision Imaging

Title: Magn**E**tic **R**esonance **I**maging-based measure of fibrosis in en**T**eric Crohn's disease (MERIT)

Supervisors: Gordon Moran (School of Medicine), Penny Gowland (School of Physics & Astronomy), Caroline Hoad (School of Physics & Astronomy) and Abhik Mukherjee (School of Medicine).

Theme: Physiological and metabolic imaging

Project Description: About 200,000 people in the UK suffer from Crohn's disease (CD). A third of patients develop stenosis within 5 years of diagnosis. Stenoses contain *fibrotic* and *inflammatory* components. Current treatments only target *inflammation*. Fibrosis can only be reliably measured at histology after surgery. Developing a non-invasive method to accurately separate fibrosis-predominant stenosis (which requires surgery) from inflammation-predominant stenosis (which may respond to anti-inflammatory therapies) is a major clinical advance.

Magnetic resonance imaging (MRI) T2 measurements and small bowel motility are sensitive to inflammation, and magnetisation transfer, multiple b-value diffusion-weighted imaging and T_2* individually primarily provide sensitivity for fibrosis.

We propose a studentship investigating the diagnostic utility of novel MRI sequences in predicting histological fibrosis in a prospective cohort validation study of CD patients needing surgery for intestinal stenoses. The student will be hosted by the Precision Imaging Beacon at UoN and supervised by Dr Gordon Moran and Prof Penny Gowland.

The student will enrol in the FHMS n-Trans PhD programme, supplemented by postgraduate modules in imaging and data analysis. They will undertake practical hands-on training to cover both the theory and practice of MRI image analysis.

This studentship will provide a unique and multi-disciplinary training and wide portfolio of skills. Students will undertake training in research methods, Good Clinical Practice, Ethics and will benefit from the Graduate School Researcher Development Programme and UoN courses providing transferrable skills, e.g. leadership, management and teaching.

This training package will equip the student with an interdisciplinary core provision, cross-cutting from academic research to computing, image analysis to knowledge transfer, regulatory matters to human research. Our students are encouraged to present their work at international conferences and submit it for publication. All previous students quickly found appropriate employment.

Consumables for this studentship will be funded by the Medical Research Council and Innovate UK.

Lead school: School of Medicine

To apply for a place on the programme you will need to:

   1. join the open day on **9 January** or contact a potential supervisor. If you wish to join the open day, please e-mail PI-Beacon@nottingham.ac.uk

   2. apply online here by **17 January**

   3. on submission send an email to PI-Beacon@nottingham.ac.uk stating your preferred project, application ref number and enclose a CV

For any enquiries please email PI-Beacon@nottingham.ac.uk