

## Molecular imaging of inflammation

### Supervisors:

Lead supervisor: Peter Harvey, School of Medicine

Co-supervisors: Morgan Alexander (Pharmacy), Amir Ghaemmaghami (Life Sciences)

**Theme:** Physiological and metabolic imaging

**Project description:** Inflammation underlies a wide array of pathologies, including cancer, neurodegeneration, and medical device side-effects. The ability to image inflammation *in vivo* would greatly aid our abilities in detection, monitoring, and treatment. Unfortunately, current MR imaging techniques are limited by a lack of molecular detail and struggle to distinguish between stages of inflammation and fibrosis. The aim of this PhD studentship would be to **develop molecular contrast agents to image inflammation *in vivo* in a variety of disease models.**

To achieve this goal, the student will focus on the design and application of novel MRI contrast agents that can target and report on inflammation biomarkers. By advancing the imaging tools at our disposal, we will be able to non-invasively monitor inflammation pathology in living subjects in real-time. Initial focus will be on preclinical rodent models to monitor the effects of inflammation in real time in disease models. Long-term translation and impact goals include aiding the development of new therapeutics and clinical translation of inflammation diagnostics.

The student will benefit from a lead supervisor with a strong background in the development and application of MRI contrast agents. The co-supervisory team are world leaders in immunology and medical device development and a diverse collaborative team span multiple departments (Pharmacy, Life Sciences, Psychology, Chemistry, Physics) will further support the project and student. The student will develop an interdisciplinary skillset, including synthetic chemistry, histology, analytical methods, MR imaging, and image analysis. It is envisaged the studentship will result in significant outputs and support a number of ongoing and future projects within the fields of medical devices and disease models. There are a number of international collaborators associated with the project and it is envisaged that the student would be able to conduct a short research placement at MIT as part of the studentship.

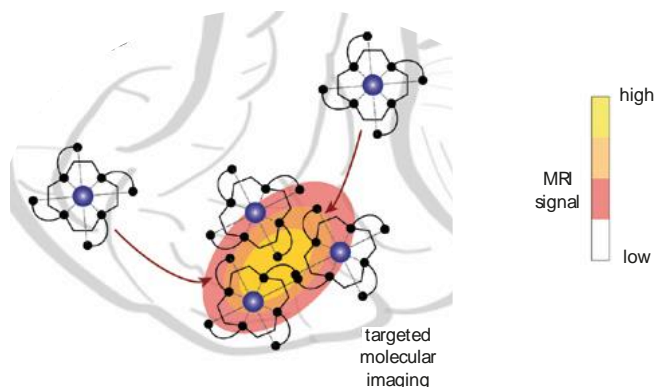


Figure 1. Simplified schematic of targeted molecular imaging. By incorporating biomarker specific tags, contrast agents accumulate at site of inflammation and lead to corresponding increase in MRI signal specifically at affected target regions.

**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](mailto:PI-Beacon@nottingham.ac.uk)
2. [apply online here by 17 January](#)
3. on submission send an email to [PI-Beacon@nottingham.ac.uk](mailto: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](mailto:PI-Beacon@nottingham.ac.uk)