University of Nottingham
UK | CHINA | MALAYSIA

Precision Imaging Beacon of Excellence
Studentship Form

Supervisors	**Dr Charlotte Bolton** School of Medicine (Respiratory) **Professor Susan Francis** School of Physics **Professor Paul Greenhaff** School of Life Sciences (MRC/ARUK Centre for Musculoskeletal Ageing Research)		
Start date	September 2018	**Duration**	3 years
Project title	**Novel cardiovascular MR in precision medicine – the cardiovascular response during acute bouts of exercise in health and disease.**		
Project abstract	In chronic obstructive pulmonary disease (COPD), a primarily lung condition affecting >1M in the UK, cardiovascular (CV) disease contributes significantly to patient morbidity and mortality. In COPD patients, traditional cardiac function assessment is challenging. However, the utility and applicability of Magnetic Resonance Imaging (MRI) to CV function at rest and during exercise in COPD offers an exciting avenue of new research, particularly when attempting to elucidate pathophysiology associated with subclinical disease. In this PhD studentship, we plan to apply standard CV MR and develop novel measures of CV function, such as real-time cardiac perfusion during exercise, to manifest and quantify cardiovascular abnormalities in COPD patients. **This PhD studentship offers an inter-school partnership to strengthen precision medicine using novel imaging modalities that have clinical relevance for future trials and focus on subclinical disease where there may be an opportunity to intervene with therapeutics.** **Objectives:** - **To develop state-of-the-art CV MR imaging protocols for use during real time exercise in healthy volunteers** - **To apply these measures to subjects with and without COPD** - **To relate these measures to baseline cardiopulmonary fitness and non-MR measures of CV function.** **Experimental plan:** **Phase 1:** Development of MR protocols in healthy volunteers to assess CV measures including cardiac output and strain myocardial tagging, aortic valve flow, and develop cardiac perfusion techniques. **Phase 2:** Application of these protocols to volunteers with and without COPD at rest and in response to exercise. Subjects will perform low-intensity, within-bore supine exercise. **Expected outcome:** Student: PhD award; publications; conference abstracts/presentation; core research skills for future academic and research career progression. UoN is a centre of excellence for MR imaging (Francis), respiratory (Bolton), and musculoskeletal (Greenhaff) research, hosting the Sir Peter Mansfield Imaging Centre, NIHR Nottingham Biomedical Research Centre and the MRC-ARUK Centre for Musculoskeletal Ageing Research. It has excellent infrastructure clinical translational research with state-of-the-art facilities.		
Queries	Please contact **PI-Beacon@nottingham.ac.uk**		
To apply	Please apply online via **the University of Nottingham application page**		