3 year PhD Studentship for September 2018 start

**Project title:** Metabolic stress in the pathology of organ injury after cardiac surgery

**Supervisors:** Prof. Gavin Murphy, Dr Marcin Wozniak, Ms Florence Lai, Dr Syabira Yusaff

**Eligibility:** UK/EU applicants only

**Project Description:**

The PhD student will work as part of the BHF Chair in Cardiac Surgery Research Group. This team consists of 3 laboratory scientists, 5 clinical trialists, 4 clinical academics and two administrators, and is the largest cardiac surgery research group in the UK. Our research aims to reduce deaths attributable to multiple organ failure.

Organ injury affecting the heart, lungs and kidneys occurs in more than a third of patients undergoing cardiac surgery and contributes to 41% of deaths and a 70% increase in healthcare costs. Our understanding of the underlying pathological mechanisms is poor. An established consensus developed over many years is that the inflammatory response to cardiopulmonary bypass combined with acute myocardial ischaemia reperfusion injury (IRI) results in acute metabolic stress and organ injury. However, attempts to improve patients’ outcomes by reducing inflammation or myocardial IRI have not reduced organ failure. Conversely, our recent research has demonstrated that altering a patient’s baseline metabolic state can prove effective; specifically we have shown that obese patients, and those with the metabolic syndrome, experience lower rates of organ failure.

Our ongoing programme of work, funded by the British Heart Foundation, is exploring the pathological basis of these observations. By identifying the underlying mechanisms, we believe that we may develop new therapeutic targets. We are conducting a series of randomised trials where we are altering patients’ metabolic state and assessing how this alters susceptibility to injury and the injury phenotype. The trials conducted in cardiac surgery patients will result in a biobank of samples that will include microvessels, myocardial and fat biopsies, as well as blood samples. The Ph.D. candidate will be involved in biopsies collection, dissection, and chromatin precipitation. Subsequent analysis of transcriptome, metabolome, and proteome will use next-generation sequencing and mass-spectrometry. Bioinformatical and statistical analysis of the data will identify critical pathways and molecules for further testing *in vitro* and biomarker discovery.

The project is an excellent opportunity for an individual interested in translational research and will provide training in necessary bench skills, proteins and nucleic acid isolation and fractionation, qRT-PCR, as well as advanced omics techniques and data analysis skills. The project will be performed in collaboration with our partners outside the UK and the applicant should be prepared to spend periods of time working in labs abroad.
Funding
The College of Life Science Studentship offers 3 years stipend at RCUK rates and a 3 year tuition fee waiver at UK/EU rates.

Entry Requirements
UK First degree in a relevant subject (2:1 or better) or international equivalent.

English Language requirements apply where applicable.

How to apply
Please submit your application using our online application system

On the Studentship section of the online application please select Studentship and CLS Studentship from the dropdown menu.

Include the project title and supervisor’s names in the proposal section of the application.

Please include
2 academic letters of reference or the contract details of referees
Copies of your degree transcript and certificate or any available marks to date if not yet completed
Personal statement about why you are interested in the project and detail any relevant research experience you may have (e.g. previous degree, work).
Evidence of English language (if applicable)