University of Leicester PhD project

Funding Source: Self-funded / Own Sponsorship

Proposed start date: negotiable

Closing date for applications: open until filled

Eligibility: UK and International

Tuition fee band 5: Overseas candidates: £27,150 per annum. Home candidates: £7,510 per annum.

Department/School: Division of Cardiovascular Sciences & Division of Respiratory Sciences

Supervisors: Dr Katy Roach kmr11@le.ac.uk and Dr Anvesha Singh as707@leicester.ac.uk

Project Title: Developing Translational Models of Fibro-calcific Remodelling to Evaluate Novel Therapies in Aortic Stenosis

Project Description

Aortic stenosis (AS) is a progressive and life-limiting condition in which the aortic valve gradually stiffens and loses function. Although it is one of the most common cardiovascular diseases worldwide, there are currently no medical treatments capable of slowing or preventing its progression. Early changes in the valve involve a complex interplay between cellular activation, tissue remodelling, and mineral-associated processes. However, because these events are difficult to study in humans, the mechanisms that drive early disease remain poorly understood, and promising therapeutic ideas have had limited avenues for translation. This PhD project aims to address this challenge by developing human-relevant experimental systems that capture early features of valve remodelling and using them to explore how novel therapeutic concepts might influence disease-related pathways.

Hypothesis

Human aortic valve cells and tissues can model early disease-like changes under controlled conditions, and these responses can be modulated by novel therapeutic approaches.

Expected Outcomes

The project is expected to generate validated human-based platforms that mimic early aspects of aortic stenosis, providing new insight into how cellular and tissue-level changes emerge and interact. These systems will offer a valuable foundation for testing innovative therapeutic strategies and identifying which approaches hold translational promise. The PhD will contribute to a clearer understanding of early aortic valve pathology and support long-term efforts to develop medical treatments for AS.

Methodologies and Training

The student will receive comprehensive training in human cell and tissue handling, primary cell culture, ex vivo model development, and approaches for assessing cellular and structural responses. They will learn a broad range of molecular, imaging, and analytical techniques used to characterise

human biological systems, alongside training in experimental design, data integration, and interpretation. The project provides opportunities to work across cardiovascular biology, fibrosis research, and translational science, developing interdisciplinary skills that are highly applicable across academic, clinical, and industrial research environments.

Entry requirements:
Applicants are required to hold/or expect to obtain a UK Bachelor Degree 2:1 or better in a relevant subject.

The University of Leicester English language requirements apply where applicable.

Application advice:

To apply please refer to application advice on the PhD subject web page.

With your application, please include:

- CV
- Personal statement explaining your interest in the project, your experience, why we should consider you in addition to confirmation of how you will pay your fees.
- Degree Certificates and Transcripts of study already completed and if possible transcript to date of study currently being undertaken
- Evidence of English language proficiency if applicable
- In the reference section please enter the contact details of your two academic referees in the boxes provided or upload letters of reference if already available.

In the funding section please indicate self funded
In the proposal section please provide the name of the supervisors and project title (a proposal is not required)

Project / Funding Enquiries: kmr11@le.ac.uk

Application enquiries to cls-pgr@le.ac.uk