University of Leicester
AIM studentship project 2026

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Section 2 – *Project Information*

Project Title	Integration of large-scale genetic and Magnetic Resonance Imaging (MRI) data to understand fibrosis across different organs

Project Summary

Fibrosis (scarring) is the natural process of wound-healing, the body's response to insult and injury. However, fibrosis can become pathological (damaging), affect organ function, and is a feature of multiple common diseases affecting almost any organ in the body. Despite this, there are limited treatments for fibrosis and it accounts for around 30% of deaths. Fibrotic diseases often differ in prevalence between males and females and may co-occur more often than expected with fibrotic diseases in other organs. Studying fibrosis across different organs simultaneously could accelerate our understanding and development of new treatments. Identification of genetic variation associated with development of fibrotic disease can give us new information about which genes are involved and new insight into the mechanisms at play. Magnetic Resonance Imaging (MRI) can reveal organ changes that are indicative of fibrosis, even before it is diagnosed. In this project, you will discover genes involved in fibrosis and correlate these findings with MRI metrics in order to better understand fibrosis development. Based primarily at the University of Leicester, you will develop skills in statistical genetics, epidemiology and functional genomics, with around 3 months spent at the University of Nottingham to develop your image analysis skills, including machine-learning approaches.

References

1. Massen et al (2024) Using Routinely Collected Electronic Healthcare Record Data to Investigate Fibrotic Multimorbidity in England. Clin Epidemiol PMCID: PMC11215821
2. Mohammadi-Nejad et al (2022) Mapping brain endophenotypes associated with idiopathic pulmonary fibrosis genetic risk. EBioMedicine PMCID: PMC9677133 (2022)
3. Chin et al (2025) Genome-wide association study of Idiopathic Pulmonary Fibrosis susceptibility using clinically-curated European-ancestry datasets. medRxiv PMCID: PMC11838657
4. Massen et al (2023) Classifying the unclassifiable-a Delphi study to reach consensus on the fibrotic nature of diseases. QJM PMCID: PMC10250078