University of Leicester
AIM studentship project 2026

First Supervisor	Dr. Edward Jarman
School/Department	School of Medical Sciences/Cancer Sciences Division/LCRC
Email	Ejj11@leicester.ac.uk www.le.ac.uk/people/ed-jarman

Second Supervisor	Prof. Sheela Jayaraman
School/Department	Health and Medical Sciences/BDI/Medicine/ Translation Medical Sciences/Centre Cancer Science, University of Nottingham
Email	Sheela.Jayaraman@nottingham.ac.uk www.nottingham.ac.uk/medicine/people/sheela.jayaraman

Additional Supervisor	Prof. Kevin Gaston, Health and Medical Sciences/BDI/Medicine/ Translation Medical Sciences/Centre Cancer Science, University of Nottingham

Section 2 – *Project Information*

Project Title	Genomic instability and mutation during inflammation-induced initiation of cholangiocarcinoma

Project Summary

This project investigates how chronic liver inflammation promotes early genetic changes in biliary epithelial cells that may lead to cholangiocarcinoma. Our work shows that cells with oncogenic mutations can misinterpret immune signals during early tumour emergence, but how these early lesions evolve into genetically complex cancers remains unclear.

As a collaboration between Dr. Ed Jarman (UoL) and Professors Jayaraman and Gaston (UoN), we will examine how the inflammatory microenvironment drives DNA damage and mutation accumulation through oxidative stress and mitogenic signalling during early tumour development, and determine whether this can be prevented using anti-inflammatory or antioxidant therapies.

The successful applicant will analyse tissue and single-cell RNA sequencing data to identify DNA damage markers and assess how liver inflammation modulates repair. Using CRISPR-edited murine organoids with p53 and Pten mutations, they will model how genetic background influences susceptibility to inflammation-induced mutagenesis. Building on these findings, the student will have the opportunity generate human bile duct organoids from healthy, inflamed, and tumour tissues at UoN to test if similar processes occur in patients and whether agents such as aspirin or resveratrol reduce inflammation-associated DNA damage in this context. In doing so we hope to inform novel cancer prevention strategies for high-risk groups

References

Edward J Jarman, Anabel Martinez Lyons, Yuelin Yao, Aleksandra Rozyczko, Scott H Waddell, Andreea Gradinaru, Paula Olaizola, Kyle Davies, Rachel V Guest, Stephanie Röessler, Timothy J Kendall, Owen J Sansom, Ava Khamseh, Luke Boulter. Epithelial state-transitions permit inflammation-induced tumorigenesis. bioRxiv 2025.06.22.660911; doi: https://doi.org/10.1101/2025.06.22.660911