**University of Leicester**

**MRC AIM Studentship Project 2025-6 entry.**

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| **Additional Supervisor** |  |

**Section 2 – *Project Information***

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| **Project Title** | Analysis of Paediatric Medulloblastoma Cellular Heterogeneity Using Single-cell transcriptomic profiling for improved therapeutic strategies. |
| **Project Summary** | |
| Brain tumours are the leading cause of cancer-related deaths in children, with medulloblastoma being the most common malignant paediatric brain tumour. Approximately one-third of medulloblastoma patients present with metastasis at diagnosis. Group 3 (G3) subtype, predominant in infants and young children, has the lowest survival rate. Current treatments are highly aggressive and multi-modal, resulting in severe long-term consequences such as cognitive dysfunction, growth impairments, and secondary malignancies for survivors. Advancing therapies for G3 has been hindered by the limited availability of cell models that replicate the G3 tumour microenvironment and insufficient understanding of the molecular composition underlying G3 cellular architecture, which influences treatment outcomes.  The aims of this project are to:  1. Use single-cell technology to characterise the clonal landscape and regulatory networks driving G3 metastasis, chemosensitivity, and relapse in next-generation 3D preclinical tumour models.  2. Identify predictive biomarkers and gene targets for improving G3 clinical treatment.  This high-impact research opportunity bridges advanced biology and clinical medicine. The student will gain exceptional technical skills through training within a cross-disciplinary supervisory team, contributing significantly to novel therapeutic advancements. While led by the University of Leicester, the student will also collaborate at the University of Nottingham to develop 3D in-vitro tumour models. | |
| **References** | |
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