



European Research Council  
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## Fully funded PhD Positions in Cancer Research #META-CHIP University College Dublin

### Development of a lung metastasis-on-a-chip model for osteosarcoma as a biomimetic testing platform for drug discovery and therapeutic innovation.

**About this Project:** Osteosarcoma is a highly aggressive bone cancer that primarily affects children. Treatment is often radical and debilitating, and despite the clinical urgency for more effective therapies, there has been no significant change in treatment options since chemotherapy was introduced in the 1970s. Lung metastasis is the most critical clinical factor, with 70% of patients who develop lung metastasis succumbing to the disease within three years. While there is a pressing clinical need for newer and more effective treatment options, discovering druggable targets and developing innovative therapies to inhibit metastatic progression will require a deeper and more detailed understanding of osteosarcoma metastasis biology.

Metastasis is a complex and dynamic process, involving several stages: local invasion, intravasation, survival in circulation, extravasation, and colonization. Emerging evidence suggests the existence of a "pre-metastatic niche" (PMN), in which growth factors from the primary tumour "prime" the lung tissue for tumour cell engraftment.

Organ-on-a-chip technologies using patient-specific cells represent a promising approach to understanding this complex process. This project aims to develop a custom-built multi-tissue organ-on-chip device that successfully models the PMN in osteosarcoma. Building on our previously established osteosarcoma-on-chip device, this project will systematically profile the intricate communication between the lung and tumour, an approach that cannot be achieved using traditional animal models.

As part of the PhD program, you will receive training in organoid culture, hydrogel synthesis, 3D bioprinting, organ-on-chip design, advanced microscopy, and molecular biology analysis.

**One four-year PhD studentship** is funded by **European Research Council Starting Grant** (#META-CHIP). This studentship includes full tuition, a PhD stipend of €25,000 per annum (tax-free), and a research budget to cover costs associated with the project. Students will be enrolled in UCD's structured PhD program, which includes taught elements and transferable skills training, providing an excellent foundation for a research career. For more information, visit ([www.ucd.ie/graduatestudies/researchstudenthub/researchprogrammes/](http://www.ucd.ie/graduatestudies/researchstudenthub/researchprogrammes/)).

**About the research team:** Dr. Fiona Freeman is an Associate Professor, Conway Fellow, and funded investigator in the SFI Research Centre in CÚRAM, Advanced Materials and Bioengineering Research, and I-Form, and a PI within UCD Centre for Biomedical Engineering and Trinity Centre for Bioengineering. Dr. Freeman leads a multidisciplinary research group focused on using innovative biomedical engineering techniques to better understand and develop novel therapeutics for treating paediatric bone cancer, osteosarcoma. For more information, please visit [www.ucd.ie/freemanlab/](http://www.ucd.ie/freemanlab/).

**Minimum Qualifications:** A Master's Degree (or equivalent) in Biomedical Engineering, Molecular Bioengineering, Medicine, Veterinary Medicine, Biomedical Sciences, or a closely related field. Candidates should enjoy working as part of a team and have a keen interest in organ-on-chip development.

To apply please submit the following as a single pdf document using the following [google form](#):

1. A cover letter outlining their interest in the project any relevant experience and their future goals.
2. A detailed CV (including a list of any publications if applicable).
3. The names and contact details of two academic referees.

Interviews will take place in May 2025 via video calls. The candidate should be in a position to start their PhD by September 2025.