



**TUS**

**Technological University of the Shannon:  
Midlands Midwest**  
Ollscoil Teicneolaíochta na Sionainne:  
Lár Tíre Iarthar Láir

## **POSTGRADUATE RESEARCH OPPORTUNITY**

**Project Title:** Lung Surfactant and Biomarkers in an ARDS Chip Model

**Project Description:** Acute Respiratory Distress Syndrome (ARDS) is a severe form of lung injury characterised by disrupted alveolar-capillary barrier function, impaired gas exchange, and surfactant dysfunction. The Emulate Lung-Chip system simulates the human alveolar interface with epithelial and endothelial co-culture, fluid flow, and mechanical stretch. This project will use the chip to investigate how mechanical conditions affect surfactant production and the release of soluble biomarkers into effluent under both healthy and ARDS-like conditions.

### **Objectives:**

To model healthy and impaired breathing mechanics in the Lung-Chip through varying stretch patterns.

To assess the production of pulmonary surfactant by alveolar epithelial cells under these conditions.

To induce ARDS-like injury using clinically relevant stimuli and monitor its impact on surfactant production.

To collect and analyse chip effluent for potential ARDS biomarkers

**Supervision and Environment:** The project will be conducted within the Organ-on-Chip Bioengineering Research Group at TUS. Supervision will be provided by Dr. Emma Murphy.

**Duration of Project:** 24 months

**Funding Agency:** TUS Presidents Scholarship

**Type of Degree Offered:** MSc

### **Minimum Qualifications/Experience Necessary/Any Other Requirements:**

1. Minimum Qualification of *2.1 honours or equivalent*. (NFQ: level 8) in Biotechnology, Pharmacology, Microbiology or equivalent.
2. Experience Necessary: Molecular biology, Cell culture, Aseptic techniques, Capable of scientific writing and communication to wider audiences.
3. IELTS [International English Testing System] Applicants must have a minimum of 6.0 with no component score less than 6.0.

**Research Supervisors: Dr Emma J. Murphy (Principal Supervisor)**

**Co-Supervisors:** Dr Gustavo Fehrenbach, Dr Tielidy Lima, Dr Declan Devine

**For further information please contact: [emma.murphy@tus.ie](mailto:emma.murphy@tus.ie)**

**Application Process:** Applicants should email [pro@tus.ie](mailto:pro@tus.ie) with the completed application form (available from <https://tus.ie/rdi/research/office/funded-research/> ), a curriculum vitae (CV) and a short cover letter detailing their motivation for applying for the position. Academic transcripts & references should also be provided.

**Deadline for application:** 14/04/25