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

POSTGRADUATE RESEARCH OPPORTUNITY

Project Title: Eco-Friendly Heterogeneous Sorbents for Industrial Wastewater Treatment and Sustainable Pharmaceuticals Production (HSWSP).

Short Project Description: This project addresses two critical challenges at the intersection of environmental remediation and sustainable chemistry: the removal of toxic metal ions from industrial wastewater and the development of greener approaches to pharmaceutical synthesis. To tackle both, the project will design innovative, reusable heterogeneous catalysts built on a mesoporous silica platform.
Using microwave-assisted synthesis, mesoporous silica materials will be precisely engineered and functionalized with chelating ligands tailored for the selective capture of toxic heavy metal ions from industrial wastewater. These functionalised materials will then serve a dual purpose acting first as selective sorbents for metal remediation, and subsequently as scaffolds for anchoring catalytically active transition metal species (e.g., Pd, Cu, Au, Ni) to yield robust heterogeneous catalysts.
The resulting catalysts will be deployed in key chemical bond-forming reactions central to modern synthesis, including C–C, C–N, C–O, and C–S coupling processes. Performance will be evaluated with particular attention to catalytic efficiency, selectivity, and reusability across multiple reaction cycles. To demonstrate real-world relevance, the catalysts will be applied to the synthesis of biologically active molecules, bridging the gap between fundamental materials science and practical pharmaceutical applications.

Type of Degree Offered: PhD

Duration of Project: 4 Years

Funding Agency: TUS

Minimum Qualifications/Experience Necessary/Any Other Requirements:
The candidates must have a primary degree in a field related to Chemistry/Advanced Materials.

Minimum classification of *2.1 honours or equivalent.*

IELTS [International English Testing System] Applicants must have a minimum of 6.5 with no component score less than 6.5.

Project Lead Supervisor: Dr. Md. Shaheen Sarkar

For further information, please contact: shaheen.sarkar@tus.ie

Closing date for receipt of completed application form is 30th of June. Interviews will take place within subsequent weeks.

Download TUS Scholarship application form below, put project title Eco-Friendly Heterogeneous **in the subject line to be considered and email pro@tus.ie:**
https://tus.ie/rdi/research/office/funded-research/