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

POSTGRADUATE RESEARCH OPPORTUNITY

Project Title: SulphGuard: Developing sulphur-based, animal-repelling and nutrient-releasing biodegradable polymers for sustainable livestock fencing solution

Short Project Description:
This PhD project aims to develop a new class of sulphur-based biodegradable polymers that combine animal-repellent functionality with soil nutrient release for sustainable agricultural applications. Using inverse vulcanization, the research will design polymers capable of emitting naturally repellent sulphur-based volatiles to deter livestock (e.g., sheep, deer), while gradually degrading into plant-available sulphates that enrich soil.
The project integrates polymer chemistry, materials engineering, and environmental science, with applications in livestock fencing, tree protection, and sustainable land management. The successful candidate will work within the PRISM research institute at TUS, contributing to cutting-edge research aligned with circular economy and sustainable materials innovation.

Type of Degree Offered: PhD in Polymer Engineering

Duration of Project: 48 months

Funding Agency: Technological University of the Shannon (TUS) – Strategic Research Fund (SRF)
The scholarship includes fees of €5,500, annual stipend of €16,000, a materials/consumables budget of €1500 per annum, and a one-off payment of €1000 towards a laptop.

Minimum Qualifications/Experience Necessary/Any Other Requirements:
A primary degree (minimum 2.1 Honours or equivalent) in:

- Polymer Science and/or Polymer Engineering
- Chemistry
- Materials Science
- Chemical Engineering
- or other closely related disciplines

Strong interest in:

- Experimental laboratory work
- Polymer synthesis and characterisation
- Sustainable / biodegradable materials

Desirable (but not essential):

- Experience with polymer processing or characterization techniques (e.g., FTIR, DSC, TGA, SEM)
- A related publication record is desirable
- Knowledge of biodegradable materials or green chemistry
- Basic data analysis or modelling skills

The successful candidate should demonstrate excellent time management and organisational skills, with the ability to plan and execute research tasks independently while meeting project deadlines. Strong project management capabilities are essential, including the ability to prioritise work, manage multiple activities, and maintain accurate research records.
The candidate should also possess good problem-solving skills, attention to detail, and the ability to work both independently and as part of a multidisciplinary research team. Effective communication skills (written and verbal) and a proactive, self-motivated attitude are highly desirable.

IELTS requirement: Minimum overall score of 6.5 with no component below 6.5

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

Supervisory team:
Project Lead Supervisor:
Dr Yuanyuan Chen
Co-Supervisor:
Dr Amin Abbasi

The project will be hosted at the PRISM Research Institute, Technological University of the Shannon (Athlone campus), with access to advanced facilities for polymer synthesis and processing, thermal and mechanical analysis, spectroscopy and microscopy, and environmental degradation testing

Closing date for receipt of completed application form is **30th Jun 2026.** Interviews will take place within subsequent weeks.

For further information, please contact:
Dr Yuanyuan Chen; Yuanyuan.chen@tus.ie
Dr Amin Abbasi; amin.abbasi@tus.ie

How to Apply:
Download TUS Scholarship application form below, put project title: SulphGuard in the subject line of the email for your application to be considered and email the application to pro@tus.ie:
https://tus.ie/rdi/research/office/funded-research/