THE UNIVERSITY of EDINBURGH

Job Description

Internship Title: Investigating the cytotoxicity of nanoplastics on bacterial populations under varied exposure conditions using fluorescence-based techniques

Department/ School	School of Engineering, University of Edinburgh Advanced Chemical Instrumentation Suite & ACIS Wet Lab, School of Chemistry
Reports To	Santiago Romero-Vargas Castrillon, Santiago@ed.ac.uk, IIE, School of Engineering Jennifer Garden, J.Garden@ed.ac.uk, School of Chemistry PHd Mentor: Yazhini Vinoth Kumar – s2238098@ed.ac.uk

Job Purpose

The role includes preparing bacterial cultures, treating them with nanoplastic suspensions, and utilizing advanced fluorescence microscopy and spectroscopic techniques to evaluate cell viability. Additionally, the student will apply image processing software and statistical analysis to interpret results. This placement provides hands-on experience in microbiology, nanomaterials, and fluorescence imaging, enhancing both technical and analytical skills.

Main Responsibilities

- Conduct laboratory experiments on *E. coli* and nanoplastic interactions (40%)
- Operate fluorescence microscopy, spectrophotometry, CFU assays, and OD600 measurements (30%)
- Analyse and interpret experimental data (20%)
- Compile research findings into a report and presentation (10%)

Knowledge Skills and Experience (required for the role)

Attribute	Essential	Desirable
Education, Qualifications & Training		- Experience with basic laboratory techniques is desirable

		- Prior research experience desirable but not required
Knowledge & Experience	- Excellent oral and written communication skills - Teamwork skills - Time management skills	

Person Specification

Planning and Organising
- Develop a structured research plan.
- Maintain accurate experimental records.

Problem Solving
- Develop a structured research plan.
- Maintain accurate experimental records.

Decision Making
- Determine optimal experimental conditions.
- Assess viability assay results for accuracy

Key Contacts:
PhD Mentor - Yazhini Vinoth Kumar
Santiago Romero-Vargas Castrillon

Dimensions
Closing date for applications: Wednesday 14th May 2025 (Midnight)
Start date: 1st July – 22nd August 2025 (8 weeks)
Hours per week and preferred pattern/ restrictions (if applicable) – 35 hours per week

Additional Information

Project Outline
In this project you will learn about the environmental impact of nanoplastic waste, a contaminant of emerging concern. In collaboration with the supervisory team and one of their PhD students, you will learn a host of techniques to evaluate the toxicity of nanoplastics. Specifically, you will:
- Prepare and characterize nanoplastic suspensions.
- Culture *E. coli* and expose it to varying concentrations of nanoplastics.
- Use fluorescence microscopy and spectrophotometry to assess bacterial viability.
- Perform colony-forming unit (CFU) assays to quantify viable bacteria.
- Measure optical density (OD600) to assess bacterial growth over time.
- Analyse and interpret data to understand cytotoxic effects.
- Compile findings into a final report and presentation.

Timeline:

- Week 1: Literature review, experimental design, laboratory induction, safety training.
- Week 2: Preparation of nanoplastic suspensions and bacterial cultures. Microscopy and spectrophotometer instrument training
- Week 3-4: CFU assays, and OD600 measurements.
- Week 5-6: Nanoplastic exposure experiments, fluorescence-based Live/Dead assays
- Week 7: Data analysis and final report preparation.
- Week 8: Presentation of results.

Budget

A maximum of £500 towards project costs is available.

Location

Primary location: Environmental Engineering Laboratory and ACIS Wet Lab, University of Edinburgh, Kings Buildings Campus

Facilities: Desk, computer, lab access, safety equipment.

Health & Safety Requirements for the role

None

Key Job hazard information specific to the role

This role may result in potential exposure to certain hazards as listed below. These will be risk assessed by the school or department, which may require you to participate in, for example, health surveillance or follow other health and safety requirements.

- Working with pathogens or pathogen infected materials.

Programme Information

The Research Experience Programme (REPs), funded by NERC, offers paid research opportunities for undergraduate students. The programme is designed to address both demographic and diversity challenges in the environmental sciences, as well as thematic skills gaps, such as quantitative skills.
This is a valuable opportunity to gain hands on research experience, boost your employability, and explore potential pathways into further study or careers in environmental science.

For full details on how to apply and the selection process, please visit our REP webpage

Application Support

The University's Careers service provides a wide range of resources to support your application, including guidance on CVs, cover letters, and interview preparation.
Students undertaking a REP placement will also have the opportunity participate in the Edinburgh Award - a structured programme that helps you reflect on and gain recognition from the University for the skills and attributes developed during your internship.
For more information, you can book an appointment with a Careers Consultant via MyCareerHub.

Eligibility Criteria

To be eligible for a REP placement, applicants must meet **all** of the following criteria:

• Be currently studying towards their first undergraduate degree studies (including integrated Master's degrees) in a UK Higher Education institution, in any science discipline
Note: *Final year students are eligible if they still hold student status at the* ***start of the placement,*** *even if the student graduates during the course of the placement.*

- Be eligible for subsequent NERC PhD funding as defined here:
- A UK citizen who has been living in the UK for at least the past 3 years OR
- An EU citizen with pre-settled or settled status under the EU Settlement Scheme OR
- A non-EU citizen who has obtained the right to remain in the UK - known as 'indefinite leave to remain' (ILR) OR
- An International/EU student currently studying in the UK under a Tier 4 or Student Route Visa with validity until at least September 2025.

REPs **do not** meet the requirements for visa sponsorship. As such, students who are not currently residing in the UK or who do not hold a valid UK visa are not eligible to apply.

You cannot take part if you are a visiting student, or have previously taken part in REP programme.

Privacy Statement

In addition to the University's HR Privacy Information Notice, please read the Student and Graduate Privacy Statement: Internships and work experience programmes to understand how your personal information will be collected, used, and stored as part of the application process.

If you require this document in an alternative format, please email us at:
e5dtp.info@ed.ac.uk