

Research Associate in Automated Formulation and Computational Design of Antimicrobial Delivery Systems

Job Ref: REQ260782

Department summary:

The Department of Chemical Engineering offers a multidisciplinary and collaborative research environment that fosters innovation, creativity and scientific excellence. The Department provides access to a wide range of world-class facilities and expertise, including biotechnological and microbiological laboratories, the Loughborough Materials Characterisation Centre, advanced automation and digital manufacturing capabilities, and extensive chemical engineering research infrastructure relevant to this post. Researchers benefit from a vibrant academic community with strong links across engineering, materials, manufacturing and healthcare disciplines, alongside established industrial collaborations and a shared commitment to addressing global challenges in sustainable manufacturing, biotechnology, energy and the circular economy. Staff are supported to develop their research careers, build interdisciplinary collaborations and contribute to impactful, internationally recognised research.

Project Description:

Antimicrobial resistance is one of the greatest threats to global health, and discovering new antimicrobials is only half the battle. They also need to reach the site of infection, stay active, and work alongside the body's own healing mechanisms. This project tackles that challenge by developing biocompatible eutecto-gels: multifunctional, non-dehydrating gels built from deep eutectic solvents, combining antimicrobial agents with healing factors. This post is part of an EU-funded JPIAMR grant; Nanoheal – from bench to bedside, which is a consortium of seven global university partners developing the next generation of antimicrobial and wound-healing materials.

Job Description

Job Family and Grade: Specialist and Supporting Academic Grade 6

Job Purpose

You will combine laboratory automation with computational design to discover advanced delivery systems, taking formulation discovery from slow, manual trial and error to rapid, data-driven optimisation.

You will use automated, programmable high-throughput screening technology to build and test a broad library of candidate gel formulations. You will then pair the experimental data with quantum mechanical calculations, molecular dynamics, and cheminformatic descriptors to train machine-learning models. Ultimately, you will optimise gel performance against targets defined with partners across the wider project.

Job Duties

- Adapt formulation methods for on-platform gelation and rapid functional assessment using automated screening.
- Prepare and characterise gels, including rheology, viscometry and thermal analysis, to build a high-quality experimental property database.
- Integrate experimental and computational data to build predictive models and identify promising new formulations.
- Develop machine learning protocols to optimise gels across a range of functional parameters.
- Work with partners across the globe to align results with project needs, and present findings.

Your duties will also include:

- Being responsible for conducting the day-to-day running of the project, including formulation of detailed plans for the project based on broad guidance from the project team.
- Feeding back to the project team on progress, to make recommendations for next steps, and contributing ideas for new research and enterprise directions.
- Writing up regular progress reports and presenting outcomes to all Investigators and Collaborators and writing research papers suitable for publication in high-quality academic journals.
- Travelling to attend meetings, contribute to conferences, and make presentations both within the project partners working group and to external stakeholders.
- Contributing to project promotion and public engagement events.
- Always maintaining confidentiality and ensuring compliance with confidentiality, contractual, data protection, and intellectual property requirements.
- Assisting the academic staff in the project team with the supervision of undergraduate MSc and PhD project work and day-to-day supervision and support of other researchers.
- Engaging in relevant professional development and training opportunities in the University (or elsewhere) that are consistent with the needs and aspirations of the project.

Points To Note

The purpose of this job description is to indicate the general level of duties and responsibility of the post. The detailed duties may vary from time to time without changing the general character or level of responsibility outlined in the document.

Organisational Responsibility

Reports to the: Project Principal Investigator

Direct Reports: N/A

Budget Responsibilities: N/A

Structure Chart: N/A

Person Specification

Your application will be assessed based on the essential and desirable criteria listed below.

Applicants are strongly encouraged to explicitly demonstrate how they meet each essential (and desirable) criteria at the application stage. The criteria that you need to demonstrate in your application will be listed as Stage 1 in the table below.

Stages of assessment are as follows:

- 1 – Criteria measured at Application
- 2 – Criteria measured at Test/Assessment Centre/Presentation
- 3 – Criteria measured at Interview

Essential Criteria:

Area	Criteria	Stage
Experience	Current or recent relevant work experience in an academic or industrial environment	1, 3
	Experience in one or more of the following areas: chemistry, chemical engineering, materials science, soft matter physics, computational chemistry, formulation science or a related discipline	1, 3
	Authoring original work for academic journal papers, conference papers or technical reports	1
Skills and abilities	Hands-on experience with laboratory automation or high-throughput experimentation, and/or strong skills in computational modelling or machine learning.	3
	Excellent written and oral communication skills	1, 3
	Self-motivated with ability to meet deadlines	3
	Able to manage time and task effectively to meet project deadlines and prioritise workload with minimum supervision	3
	Able to build and maintain effective working relationships with academic colleagues, students, and external partners to support collaborative research and communication of findings.	3
	Ability to write project reports and make technical presentations to industrial and academic research groups	1,3
	Knowledge of relevant Health & Safety issues	3
Training	Willingness to undertake appropriate further training and to adopt new procedures as and when required	1,3
Qualifications	Post-graduate qualification to Doctoral level (or close to completion) in chemistry, chemical engineering, materials science, soft matter physics, computational chemistry, or a related discipline.	1
Other	Demonstrate an ability to behave in a way that adheres to equitable and inclusive working practices, while respecting diversity of thought and supporting freedom of speech and expression.	1,3
	Willingness to travel	1,3

Desirable Criteria: These are skills, experience and competencies that are additional extras that may be used to narrow the pool down if we receive a high volume of applications all meeting the essential criteria.

Area	Criteria	Stage
Experience	Knowledge of formulation challenges, and approaches to solve them	1,3
	Developing proposals for funding from external agencies	1,3
	Working in an international and collaborative academic research environment	1,3
	Experience of teaching and / or supervision of students in relevant areas	1,3
Skills and abilities	Authoring original work, in the highest quality refereed academic journals	1
	A background in formulation, soft materials, ionic liquids, deep eutectic solvents or gels, alongside familiarity with rheology or thermal analysis	1,3
	Working knowledge of python and ability to code	1,3
	Working knowledge of quantum chemical, molecular dynamics and machine learning methods	1,3
	A problem-solving mindset	1,3

Conditions of Service

The appointment will be subject to the [University's Terms and Conditions of Employment](#) relevant to the job grade.

Shared University Responsibilities

As a member of the Loughborough community, you are expected to:

- Take reasonable care of yourself, others and the environment, and to prevent harm by your acts or omissions. All staff are therefore required to adhere to the University's Health, Safety and Environmental Sustainability Policies & Procedures.
- Support and contribute to the University's commitment to Equity, Diversity, and Inclusion (EDI), while carrying out all duties in a way that respects these principles and upholds the right to free expression. Further information about EDI at Loughborough and our strategic aims is available on our website

Our Purpose, Vision, and Values

Our purpose, Vision and Values underpin all that we do and shape how we work together at Loughborough.

We're proud to promote our values: **Adventurous, Collaborative, Creative, Authentic** and **Responsible**. Our people bring these values to life every day, and they are central to the positive and supportive culture that makes Loughborough unique.

If you join us, you'll be encouraged to bring these values to life in your own work and contribute to the positive, supportive culture that makes Loughborough unique.

Read more about our [vision and values](#).

Our Accreditations



We strive to create a culture that supports equality and celebrates diversity throughout the campus. The University holds a [Bronze Athena SWAN award](#) which recognises the importance of support for women at all stages of their academic career.



We are proud to be a [Race Equality Charter Member](#). The Charter aims to improve the representation, progression and success of all minority ethnic staff and students within higher education and address issues of racism within higher education institutions (HEIs).



We are proud to be a Disability Confident Employer and have adopted a proactive approach to employing disabled people and to creating a more diverse workforce. We ensure that our recruitment processes are inclusive and accessible. We guarantee to offer an interview to all applicants who have declared themselves with a disability, provided they meet the essential criteria for a role. We proactively anticipate and provide reasonable adjustments and support existing employees who acquire a disability or long-term condition to thrive in the workplace.



We are a real living wage employer, and our Living Wage Employer Mark shows our commitment to paying our staff according to the cost of living.



We are proud supporters of the [City of Sanctuary movement](#) and delighted to be recognised as a University of Sanctuary. This national network brings together, university staff, lecturers, academics and students, who together work to make Higher Education institutions place of safety, solidarity and empowerment for people seeking sanctuary.

As part of the University's ongoing commitment to redeployment, please note that this vacancy may be withdrawn at any stage of the recruitment process if a suitable redeployee is identified.