UNIVERSITY OF LEICESTER

Job Summary

Job Title: Research Associate in Sulfur Biology
Grade: 7
Salary: £40,704 to £46,970 per annum pro rata
Department: Molecular and Cell Biology, LISCB
Hours/Contract: Full-time, fixed-term (3 years)
Job Family: Teaching and Research
Reference: 14185

Role Purpose

To lead an interdisciplinary research project investigating how hypoxic Escherichia coli convert cystine into reactive sulfur species and elemental sulfur. The role will combine microbial physiology, genetics and chemically rigorous sulfur analysis to define the mechanisms and consequences of bacterial sulfur metabolism. The postholder will take day-to-day ownership of the project, work independently and collaboratively, deliver agreed milestones, and drive the work through to high-quality publication and future research development.

Main Duties and Responsibilities

Research

- Lead the experimental delivery of the bacterial sulfur biology project, taking ownership of day-to-day planning, troubleshooting, data quality and completion of agreed milestones.
- Design and perform experiments to determine how hypoxic E. coli convert cystine into reactive sulfur species and elemental sulfur (S8), and how sulfur products are handled or exported by bacterial cells.
- Use appropriate microbiological and molecular approaches, which may include anaerobic or hypoxic culture, bacterial growth and physiology assays, genetic perturbation, strain construction, complementation and protein or metabolite analysis.
- Apply chemically rigorous thinking to sulfur speciation, reaction mechanism, controls, sample handling and interpretation. Work with established analytical workflows including triphenylphosphine derivatisation, GC-MS, 31P-NMR, LC-MS, Raman spectroscopy, electron microscopy and energy-dispersive X-ray spectroscopy, with specialist support where appropriate.
- Lead the collection, evaluation, interpretation and secure recording of research data, ensuring that conclusions are supported by appropriate controls, replication and quantitative analysis.
- Integrate microbiological, biochemical and chemical datasets to build mechanistic models of bacterial sulfur metabolism under low-oxygen conditions.
- Identify experimental problems early, develop practical solutions and adapt research plans while maintaining momentum towards project outputs.
- Prepare figures, manuscripts and supporting datasets, and take a leading role in bringing research projects to completion and publication.
- Present findings at research meetings and national or international conferences, and communicate results clearly to collaborators from different disciplinary backgrounds.
- Work with internal and external collaborators in microbiology, chemical biology, analytical chemistry, imaging and related areas.
- Contribute ideas and preliminary data to follow-on grant applications, fellowships and development of the wider reactive sulfur biology programme.

Athena Swan Silver Award · Race Equality Charter Bronze Award · disability confident LEADER · LGBT+ 2020 - 2021 AWARDEE ORGANISATION · Stonewall DIVERSITY CHAMPIONS

- Provide day-to-day guidance to postgraduate and undergraduate researchers working on related projects, while maintaining a collegiate and supportive laboratory environment.

Professional Development

- Develop expertise at the chemistry-biology interface, including bacterial physiology, reactive sulfur chemistry, quantitative analysis and scientific writing.
- With support from the Principal Investigator and collaborators, identify opportunities for fellowship applications, specialist training and career development.

Impact and Knowledge Exchange

- Contribute to dissemination, collaboration and knowledge exchange arising from the project, including engagement with academic, industrial and technical partners where appropriate.
- Support the development and sharing of robust methods for detecting and quantifying reactive sulfur species and elemental sulfur in biological systems.

Leadership and Citizenship

- Contribute actively to the research culture of the Switzer laboratory, the Department of Molecular and Cell Biology and the wider University.
- Support and guide junior researchers, share expertise and help maintain high standards of experimental practice, data integrity and laboratory organisation.

Internal and External Relationships

- Regular interaction with the Principal Investigator and members of the Switzer laboratory.
- Liaison with internal and external academic, technical, and industrial collaborators contributing specialist expertise in sulfur analytics, spectroscopy, imaging, bacterial systems or related methods.
- Appropriate support and guidance for postgraduate, undergraduate and visiting researchers involved in related work.

Planning and Organising

The postholder will manage time and experimental resources effectively to deliver the priorities of the project. The role requires the ability to:

- Develop practical experimental plans aligned with the project objectives, milestones and publication strategy.
- Prioritise decisive experiments, maintain accurate records and coordinate access to specialist facilities and collaborators.
- Run parallel workstreams without losing focus on project completion.
- Review data critically, recognise when an approach is not working and implement justified alternatives.
- Communicate progress, risks and resource needs clearly to the Principal Investigator.
- Prepare manuscripts, datasets, presentations and other outputs to agreed standards and deadlines.

Qualifications, Knowledge and Experience

UNIVERSITY OF LEICESTER

Job Summary

Essential

- PhD, or equivalent research experience, in microbiology, biochemistry, chemical biology, chemistry or a closely related discipline.
- Evidence of taking substantial ownership of a research project and bringing experimental work through to a completed output, such as a manuscript, preprint, dataset, method or equivalent deliverable.
- Demonstrated analytical problem-solving ability and a rigorous approach to experimental design, controls and data interpretation.
- Sufficient chemical awareness to reason about molecular structure, reactivity, speciation and mechanism in a biological context.
- Experience in one or more relevant experimental areas, such as bacterial culture, microbial physiology, molecular microbiology, genetics, biochemistry, metabolite analysis, redox biology or analytical chemistry.

Desirable

- Hands-on experience with E. coli or another genetically tractable bacterial system.
- Experience of anaerobic or hypoxic microbial culture.
- Experience with bacterial genetics, strain construction, CRISPR interference, knockout or complementation approaches.
- Experience analysing sulfur metabolites, redox-active molecules or chemically labile biological species.
- Experience with one or more relevant analytical methods, including GC-MS, LC-MS, NMR, Raman or infrared spectroscopy, TEM, SEM or EDS.
- Experience integrating data across chemistry and biology, or working effectively in an interdisciplinary research environment.
- Evidence of leading manuscript preparation or driving a project to publication.

Skills, Abilities and Competencies

Essential

- Ability to work independently, make sound experimental decisions and maintain momentum when results are uncertain or technically challenging.
- Ability to plan, prioritise and complete research activities against agreed milestones.
- Excellent written and verbal communication, including the ability to explain complex chemical and biological concepts clearly.
- Ability to work constructively with researchers from different disciplinary backgrounds and with internal and external collaborators.
- Commitment to reproducible research, accurate record-keeping, data integrity and safe laboratory practice.
- Ability to evaluate evidence critically rather than rely on assumptions about biological or chemical mechanism.
- Collegiate approach and willingness to share expertise, support students and contribute to the wider research team.
- Commitment to continued professional development.

Desirable

- Experience supervising or training students or junior researchers.
- Experience coordinating collaborative research or access to shared analytical facilities.
- Awareness of research budgeting and resource management.

**Criteria to be used in shortlisting candidates for interview*

Athena Swan Silver Award · Race Equality Charter Bronze Award · disability confident LEADER · LGBT+ 2020 - 2021 AWARDEE ORGANISATION · Stonewall DIVERSITY CHAMPIONS

UNIVERSITY OF LEICESTER

Job Summary

Reason for Fixed Term Contract

The reason for the fixed term contract is stated in section 1.9 in the summary of contractual terms in your contract of employment.

Criminal Declaration

If you become an employee, you must inform your manager immediately, in writing, if you are the subject of any current or future police investigations/legal proceedings, which could result in a criminal offence, conviction, caution, bind-over or charges, or warnings.

Supporting University Activities

As a University of Leicester citizen, you are encouraged to support key university activities such as clearing, graduation ceremonies, student registration and recruitment open days. We encourage all staff as citizens to work flexibly across the University if required. If supporting these activities is likely to affect your workload, please speak to your line manager in the first instance

University Values

Inclusive - We are diverse in our makeup and united in ambition. Our diversity is our strength and makes our community stronger.

Inspiring - We are passionate about inspiring individuals to succeed and realise their ambitions. We challenge our community to think differently, to get involved, and to constantly embrace new ideas.

Impactful - As Citizens of Change we will generate new ideas which deliver impact and empower our community

Freedom of Speech

The University is committed to upholding freedom of speech and academic freedom within the law throughout our recruitment processes. We ensure that all candidates are considered based on merit and suitability for the role, without regard to their lawful viewpoints or the expression of challenging or controversial ideas. Our recruitment policies and practices are designed to protect applicants from discrimination or adverse treatment on the basis of their opinions, and to foster an environment where open debate and diverse perspectives are valued as essential to our academic mission.

Equity and Diversity

We believe that equity, diversity and inclusion is integral to a successful modern workplace. By developing and implementing policies and systems that challenge stereotypes across all aspects of our work, we have a culture that recognises and values the diverse contributions of our staff which benefits everyone. Our strong values of inclusivity and equality support our efforts to attract a diverse range of high quality staff and students, and identify our University as a progressive and innovative workplace that mainstreams equality, diversity and inclusion.

Athena Swan Silver Award
Race Equality Charter Bronze Award
disability confident LEADER
LGBT+ 2020 - 2021 AWARDEE ORGANISATION
Stonewall DIVERSITY CHAMPIONS