UNIVERSITY OF LEEDS

CANDIDATE BRIEF

Research Fellow in Lectin Clustering and Signalling, School of Food Science and Nutrition

Salary: Grade 7 (£37,099 – £44,263 per annum)

Reference: ENVFS1101

Fixed-term for 30 months from 1st May 2024

We will consider job share/flexible working arrangements.

Research Fellow in Lectin Clustering and Signalling
School of Food Science and Nutrition
Faculty of Environment

Are you an ambitious researcher looking for your next challenge? Do you have a background in protein functional studies? Are you interested in exploiting multidisciplinary approaches to address challenging biological questions? Do you want to further your career in one of the UK's leading research-intensive universities?

We are looking for a highly motivated BBSRC-funded Postdoctoral Research Fellow to join a dynamic, interdisciplinary team, focusing on employing protein engineering, surface biophysical techniques and high resolution imaging to elucidate mechanisms underlying multivalent interactions inducing protein clustering on surfaces and modulating immune cell signalling. You will actively work with supervisors from the Schools of Food Science & Nutrition Chemistry, Physics & Astronomy and Chemical & Process Engineering. The supervision team has strong track records (see example papers, *J. Am. Chem. Soc.* **2017**, *139*, 10833; **2020**, *142*, 18022; **2022**, *144*, 17346; *Nature Chem*. **2020**, *12*, 832; *Angew. Chem*. **2022**, *134*, e202206919; *JACS Au*, **2023**, *3*, 1755; *Adv. Mater.* **2021***, 33, 2008307*) and complimentary expertise and skills in this research field.

You will be responsible for producing recombinant proteins, anchoring them onto supported-lipid bilayers, monitoring how ligand binding induces protein clustering and re-arrangement, and correlating results with cellular function outcomes. The project aims to deepen our understanding on how extracellular multivalent binding signals are transmitted across cell membranes and regulate immune cell functions, allowing us to manipulate immune responses as potential effective treatments against infectious and autoimmune diseases and other immune dysregulation diseases, including cancer.

What does the role entail?

As a Research Fellow your main duties will include:



- Expressing recombinant polyhistidine tagged target lectins (proteins) from *E coli.,* purifying labelling and characterising proteins using chromatography, gel electrophoresis and mass spectrometry;
- Preparing and characterising compact, polyvalent glycan-nanoparticles (e.g., quantum dots/rods, gold nanoparticles) with tuneable glycan density and flexibility.
- Anchoring lectins on supported lipid bilayers and determining their multivalent binding affinity, kinetics and thermodynamics with glycan-nanoparticles using quartz crystal microbalance and spectroscopic ellipsometry;
- Investigating glycan-nanoparticle binding induced protein clustering and re-organisation on supported lipids bilayers using super-resolution fluorescence and transmission electron microscopy;
- Investigating the effect of glycan-nanoparticle binding on lectin clustering on dendritic cell (DC) immune functions (e.g., DC maturation, cytokine production);
- Taking a lead role, with guidance and supervision from the principal investigators, to move the project forward;
- Assisting in the identification and development of potential areas of research and drafting research papers for publication in leading international journals;
- Disseminating research results through presentations in recognised national and international conferences and other events. Engaging in knowledge-transfer and public-engagement activities where appropriate;
- Contributing to the training of both undergraduate and postgraduate students, including the assistance of project supervision in areas relevant to this project;
- Continually updating your knowledge, understanding and skills in the research field in which you work;
- Contributing to, and encouraging, a safe working environment.

These duties provide a framework for the role and should not be regarded as a definitive list. Other reasonable duties may be required consistent with the grade of the post.

What will you bring to the role?

As a Research Fellow you will have:

- A PhD (or have submitted your thesis before taking up the role) in the field of biochemistry, biophysics or a related discipline;



- Demonstrated excellent skills and sound knowledge on recombinant protein expression, purification, characterization, biophysical studies of protein-ligand interactions, and data interpretation;
- The ability to design, execute and write up research independently, to the standard required for international publications;
- A proven track record of peer-reviewed publications in high impact, leading international journals;
- Excellent communication skills, both written and verbal and the ability to communicate your research at national and international conferences;
- Good time management and planning skills, managing competing demands and work effectively under pressure without close support, and efficiently meeting deadlines;
- Attention to detail, a commitment to performing high quality research, and willingness to work positively and proactively with colleagues.

You may also have:

- Experience in anchoring proteins on supported lipid bilayers, performing surface binding and characterisation studies.
- Experience in cell biology assays such as FACS, and confocal fluorescence microscopy

How to apply

You can apply for this role online; more guidance can be found on our How to Apply information. Applications should be submitted by **23.59** (UK time) on the advertised closing date.

Contact information

To explore the post further or for any queries you may have, please contact:

Dr Yuan Guo
Email: y.guo@leeds.ac.uk

Professor Dejian Zhou
Email: d.zhou@leeds.ac.uk



Additional information

Find out more about the Faculty of Environment. Faculty of Engineering and Physical Sciences

Find out more about the School of Food Science and Nutrition. School of Chemistry | University of Leeds, School of Physics and Astronomy | University of Leeds, School of Chemical and Process Engineering | University of Leeds

A diverse workforce

The Faculty of Environment is proud to have been awarded the Athena SWAN Silver Award from the Equality Challenge Unit, the national body that promotes equality in the higher education sector. Our equality and inclusion webpage provides more information.

Working at Leeds

Find out more about the benefits of working at the University and what it is like to live and work in the Leeds area on our Working at Leeds information page.

Candidates with disabilities

Information for candidates with disabilities, impairments or health conditions, including requesting alternative formats, can be found on our Accessibility information page or by getting in touch with us at disclosure@leeds.ac.uk.

Criminal record information

Rehabilitation of Offenders Act 1974

A criminal record check is not required for this position. However, all applicants will be required to declare if they have any 'unspent' criminal offences, including those pending.

Any offer of appointment will be in accordance with our Criminal Records policy. You can find out more about required checks and declarations in our Criminal Records information page.