UNIVERSITY OF LEEDS

CANDIDATE BRIEF

MSCA PhD Fellow in Cross-Disciplinary Glycoscience Research

(DC3 – Targeting tissues using multivalent lectin-glycan interactions

Salary: £53,780 per annum (plus family allowance, dependent on eligibility), in line with MSCA Doctoral Network requirements

Reporting to: Prof Bruce Turnbull

Reference: EPSCH1130

Closing date: Monday 30 March 2026

Available on a fixed-term basis for 36 months (to complete specific time limited work).

Location: Leeds main campus with scope for hybrid working.

We are open to discussing flexible working arrangements.

PhD Fellow in Cross-Disciplinary Glycoscience Research Horizon Europe Marie Skłodowska-Curie Doctoral Network.

Are you keen to advance glycoscience research across disciplines? Do you have relevant research experience in chemistry or biochemistry and a keen interest in developing molecular tools to probe complex protein/glycan interactions? Are you eager to develop your expertise, push the boundaries of knowledge, and pursue a PhD in one of the UK's leading research-intensive universities?

Overview of the Role

GLYCOCALYX is a Horizon Europe Marie Skłodowska-Curie Doctoral Network (MSCA-DN). It brings together 15 leading European partners in a transnational network, implementing a multidisciplinary and intersectorial research and training programme between the academic and industrial partners, to research the self organisation and barrier functions of the mammalian glycocalyx.

Virtually all mammalian cells are covered with a dense and complex coat of sugar chains (glycans) known as the glycocalyx, which is essential for multicellular life. Glycocalyces accomplish critical functions in inter-cellular communication, controlling tissue development, homeostasis and repair, inflammatory and immune responses, neuronal connectivity, and symbiosis with bacteria. However, when dysregulated, they can promote immune diseases, neurodegeneration and cancer. Glycocalyces also act as the first line of defence against pathogens, but some pathogens have evolved to hijack the glycocalyx to promote infection.

Despite their importance, mammalian glycocalyces remain the 'dark matter' of biology, under-studied owing to the historical lack of preparative and analytical tools to probe the local molecular composition and transient interactions of molecules within glycocalyces, and missing physics rules to interpret experimental observations.

The GLYCOCALYX Network will train 15 PhD Fellows in chemistry, physics and biology methods and concepts required to resolve the dynamic organisation of glycocalyces; 3 of the 15 PhDs Fellows will be hosted at the University of Leeds. The projects will establish a new level of understanding of how glycocalyces perform their

many selective barriers. The PhD Fellows will receive cutting edge scientific training, alongside industry-relevant transferable skills, to equip them for careers in the medical technology sector and its underpinning research and innovations.

As MSCA PhD Fellow (DC3) in Leeds, you will develop modular, multivalent glycocalyx probes to study density-dependent lectin–glycan interactions in molecularly defined model systems, and elucidate the physical and chemical rules underlying superselective targeting. This knowledge will enable the rational design of probes for super-resolution imaging of glycocalyx organisation and for targeted delivery with exceptional cellular selectivity. You will interact and develop research collaborations with our GLYCOCALYX academic and industrial partners, and in addition you will participate in activities of the Doctoral Network, including attending training courses and work placements at other sites.

Eligibility rules: To meet the requirements of the Marie Skłodowska-Curie Doctoral Network, you must be eligible to enrol in a first doctoral degree (PhD), and must not have lived or worked in the UK for more than 12 months in the 3 years prior to recruitment date.

As well as previous research experience, you will have a Masters (or an quivalent level of qualification) in Chemistry, Biochemistry, or a related discipline.

There are no restrictions on nationality, but to engage in paid employment you must have the necessary right to work in the UK. This may involve obtaining an appropriate visa and the University of Leeds will be able to offer support and advice to the successful candidate.

Salary: The Marie Skłodowska-Curie PhD Fellow salary is fixed at £53,780 per annum (plus family allowance if applicable), in line with MSCA Doctoral Network requirements. This amount will be subject to tax and National Insurance deductions.

Main duties and responsibilities

As MSCA PhD Fellow your main duties will include:

- Actively contributing to the GLYCOCALYX Doctoral Network under the supervision of Prof. Bruce Turnbull;
- Executing world-class cross-disciplinary glycoscience research at doctoral

degree level;

- Developing initiative, creativity and judgement in applying appropriate approaches to research activities;
- Delivering the outcomes guided by the research project aims (as indicated on the GLYCOCALYX website, see Project DC3), and contributing to setting the direction of the research project and team;
- Attending biannual GLYCOCALYX Network meetings for training and to discuss the research project, and undertaking work placements with Network partners; this will involve EU-wide travel;
- Attending group meetings and seminars;
- Ensuring good day-to-day progress of work and keeping up-to-date records;
- Preparing papers for publication in leading international journals, and disseminating research results through other recognised forms of output such as conferences or public engagement;
- Working both independently and as part of a larger team of researchers and stakeholders, including providing support and advice to other members of the host research group and the GLYCOCALYX Doctoral Network and engaging in knowledge transfer activities where appropriate;
- Continually updating your knowledge, understanding and skills in the research field in which you work, and maintaining your own professional development.

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.

Qualifications and skills

Essential

- A Masters degree (or an equivalent level of professional qualification or experience) in Chemistry, Biochemistry, or a related discipline;
- The ability to meet all eligibility requirements for appointment in the UK as a Doctoral Candidate funded by the Marie Skłodowska-Curie Doctoral Network;
- You must not yet have been awarded a doctoral degree (e.g. PhD), at the time of recruitment to this role;
- You must not have resided or carried out your main activity (such as work or study) in the UK for more than 12 months during the three years prior to your recruitment to this role;

- The ability to meet the University's eligibility requirements to enrol on a PhD degree, including English language requirements if English is not your first language;
- Experience of undertaking academic research;
- Working experience in synthetic chemistry and/or DNA nanotechnology and/or recombinant protein production and/or bioconjugation;
- Excellent interpersonal and communication skills, both written and verbal, and the ability to communicate effectively with a wide range of stakeholders;
- Good time management and planning skills, with a proven ability to meet tight deadlines and to manage competing demands effectively, responsibly and without close support;
- A proven ability to work well both independently and as part of a team;
- A keen interest in working across scientific disciplines, including physics, chemistry and biology;
- A strong commitment to your own continuous professional development.

Desirable

- Working experience in glycoscience research;
- Working experience in biophysical methods for measuring binding interactions;
- Working experience in optical fluorescence microscopy;
- Evidence of contributing to papers in internationally recognised, peer-reviewed journals or evidence of publishable research in progress;
- Experience of pursuing external funding to support research.

How to apply

Your application should include:

- A cover letter (up to 400 words) explaining why you are interested in the position;
- Detailed statements in support of each of the essential and desirable qualifications and skills (as listed above);
- Your curriculum vitae;
- The name and contact information of two references, or their letters of recommendation;
- A transcript of your higher education degree courses (and degree certificates where available).


You can apply for this role online; more guidance can be found on our How to Apply information page. 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:

Professor Bruce Turnbull, Professor of Biomolecular Chemistry, and project primary supervisor
Email: W.B.Turnbull@leeds.ac.uk

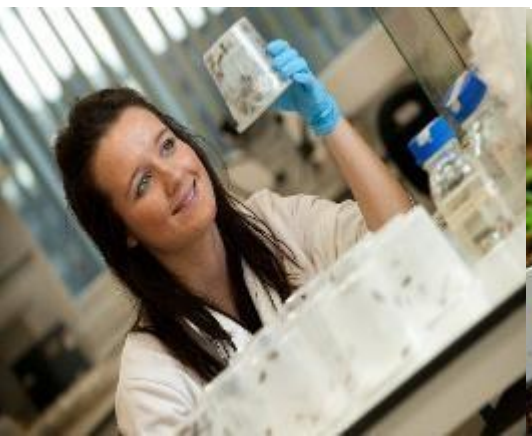
Additional information

Project DC3 – Targeting tissues using multivalent lectin-glycan interactions

Many cell types express a similar set of glycans, and it is the relative abundance of glycan epitopes, rather than the mere presence of a given epitope, that differentiates one cell type from another. This project aims to develop 'superselective' glycocalyx probes that can recognise specific glycan epitopes in a density-dependent fashion. The resulting probes will have applications in super-resolution microscopy of glycocalyx organisation, and for targeted delivery of molecules with exquisite selectivity. We have demonstrated that multivalent probes based on a flexible polymer scaffold can effectively discriminate surfaces based on the density of surface receptors (PMID: 36916901).

In this project you will develop new polymer scaffolds, and use enzymatic (PMID: 38072831) and bio-orthogonal (PMID: 36186556) chemistry to precisely functionalise lectins to assemble the modular probes. Their binding behaviour will be studied in model glycocalyces using QCM-D (PMID: 40575306), and their interactions with neuronal and endothelial cells will be visualised by super-resolution microscopy. The work combines chemical biology, glycoscience, theoretical modelling, and advanced imaging in an interdisciplinary research environment.

Training and location. The successful candidate will participate in the network's training activities and work placements at the laboratories of the participating



academic and industrial teams. Regular meetings and workshops within the GLYCOCALYX Doctoral Network will supplement the training and support provided at the University of Leeds.

This post will be based in the Turnbull Lab which belongs to the School of Chemistry (Faculty of Engineering and Physical Sciences), Chemistry for Biology and Health research section, and the interdisciplinary Astbury Centre for Structural Molecular Biology. The Turnbull Lab and offices are located in the Chemistry Building with stateof-the-art research facilities. You will collaborate with the laboratories of Prof. Jessica Kwok and Prof. Ralf Richter in the School of Biomedical Sciences, and School of Physics and Astronomy.

Find out more about the Horizon Europe Marie Skłodowska-Curie Actions, the European Union's flagship funding programme for doctoral education and postdoctoral training of researchers, and about MSCA Doctoral Networks.

Faculty and School Information
Further information is available on the research and teaching activities of the Faculty of Engineering & Physical Sciences, and the School of Chemistry.

Working at Leeds
We are a campus-based community and regular interaction with campus is an expectation of all roles in line with academic and service needs and the requirements of the role. We are also open to discussing flexible working arrangements. To find out more about the benefits of working at the University and what it is like to live and work in the Leeds area visit our Working at Leeds information page.

A diverse workforce
As an international research-intensive university, we welcome students and staff from all walks of life and from across the world. We foster an inclusive environment where all can flourish and prosper, and we are proud of our strong commitment to student education. Within the Faculty of Engineering and Physical Sciences we are dedicated to diversifying our community and we welcome the unique contributions that individuals can bring, and particularly encourage applications from, but not limited to Black, Asian and ethnically diverse people; people who identify as LGBT+; and people with disabilities. Candidates will always be selected based on merit and ability.

The Faculty of Engineering and Physical Sciences are 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.

Information for disabled candidates
Information for disabled candidates, impairments or health conditions, including requesting alternative formats, can be found under the 'Accessibility' heading on our How to Apply information page or by getting in touch by emailing HR via hr@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.

Salary Requirements of the Skilled Worker Visa Route
Please note that this post may be suitable for sponsorship under the Skilled Worker visa route but first-time applicants might need to qualify for salary concessions. For more information, please visit the Government's Skilled Worker visa page.

For research and academic posts, we will consider eligibility under the Global Talent visa. For more information, please visit the Government's page, Apply for the Global Talent visa.