



UNIVERSITY OF LEEDS

CANDIDATE BRIEF

**MSCA PhD Fellow in Cross-Disciplinary Glycoscience Research
(DC2 – Glycocalyx self-organisation into perineuronal nets)**



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

Reference: FBSBM1228

Available on a fixed-term basis for 36 months (to complete specific time limited work). This role will be based on the University campus.

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 research experience and a strong curiosity about how macromolecular interactions drive the formation of the neuronal glycoalyx, specifically perineuronal nets (PNNs), that play a crucial role in regulating neuroplasticity? 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?

[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 intersectoral research and training programme between the academic and industrial partners, to research the self-organisation and barrier functions of the mammalian glycoalyx.

Virtually all mammalian cells are covered with a dense and complex coat of sugar chains (glycans) known as the glycoalyx, which is essential for multicellular life. Glycoalyces 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. Glycoalyces also act as the first line of defence against pathogens, but some pathogens have evolved to hijack the glycoalyx to promote infection.

Despite their importance, mammalian glycoalyces 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 glycoalyces, 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 glycoalyces; 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 glycoalyces 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 (DC2) in Leeds, you will investigate how molecular self-assembly governs the ultrastructure of PNNs. PNNs play a pivotal role in regulating



neuroplasticity, a process fundamental to learning and memory. Gaining mechanistic insight into how these complex structures assemble will provide critical knowledge for developing strategies to modulate PNNs and ultimately enhance brain function. 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 equivalent level of qualification) in Biochemistry, Chemical Biology, Neuroscience, Physics in Biology, 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.

What does the role entail?

As MSCA PhD Fellow your main duties will include:

- Actively contributing to the GLYCOCALYX Doctoral Network under the supervision of [Prof. Jessica Kwok](#);
- 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 DC2), 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 Biochemistry, Chemical Biology, Neuroscience, Physics in Biology, 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 optical fluorescence microscopy, biomolecular interaction analysis, and/or biochemistry;
- 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 molecular and cellular neuroscience;
- 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:

[Jessica Kwok](#), Professor in Neuroglycoscience, and project primary supervisor

Email: j.kwok@leeds.ac.uk



Additional information

Project DC2 – Glycocalyx self-organisation: the driving force for perineuronal net formation?

Perineuronal nets (PNNs) are specialised, hierarchical assemblies of the extracellular matrix that surround subsets of neurons and play a critical role in regulating neuronal plasticity in the adult central nervous system. In the mature brain, PNNs form distinctive reticular structures, with openings that accommodate synaptic contacts. Modulation of PNNs has been shown to influence plasticity and functional recovery in a range of neurological contexts, highlighting their importance for learning, memory, and brain repair.

Despite their functional significance, the mechanisms by which PNN components organise into the characteristic PNN architectures remain poorly understood. This PhD project aims to address this knowledge gap by investigating how interactions between PNN molecules give rise to their ultrastructural organisation.

The project will adopt an interdisciplinary experimental approach to explore how PNN composition and molecular interactions ([PMID 20566484](#), [PMID 20584105](#)) influence their spatial organisation and structural properties on the neuronal surface ([PMID 29275227](#)). You will apply advanced super-resolution microscopy, neuronal culture, protein expression and labelling, molecular interaction assays, in conjunction with physics-based analysis and modelling, to determine how PNNs form. By integrating insights from extracellular matrix biology, glycobiology, neurobiology and biophysics, the research will contribute new insights into PNN organisation and function, with long-term relevance for strategies to modulate neuroplasticity.

The student will be embedded in a collaborative research environment within the GLYCOCALYX Doctoral Network and will benefit from close interaction with academic and industrial partners, alongside a comprehensive programme of training and professional development.

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 [Kwok Lab](#), with world-leading expertise in PNN function and modulation, within the School of Biomedical Sciences (Faculty of Biological



Sciences). You will also collaborate with the laboratory of [Prof. Ralf Richter](#), a leading researcher in extracellular matrix biology with a strong biophysical perspective, and [Prof. Bruce Turnbull](#), a leading biomolecular chemist and expert in carbohydrate chemistry and protein engineering.

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](#).

Working at Leeds

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 Biological 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, those who belong to a minority ethnic community; people who identify as LGBT+; and disabled people. Candidates will always be selected based on merit and ability.

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.

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.

Salary Requirements of the Skilled Worker Visa

Please note: If you are not a British or Irish citizen, you will require permission to work in the UK. This will normally be in the form of a visa but, if you are an EEA/Swiss citizen, this may be your status under the EU Settlement Scheme.

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](#).

