



**Research Centre**

School of Biotechnology

**Post title**

Postdoctoral Researcher in

Neuroscience/Biochemistry/Inflammation

**Level on Framework**

Level 1

**Post duration**

18 Months Fixed Term Contract

### **Dublin City University**

Dublin City University (DCU) is a leading innovative European University. It is proud to be one of the world's leading Young Universities and is among the world's top 2% globally. DCU is known as Ireland's University of Impact, with a mission to 'transform lives and societies' and focuses on addressing global challenges in collaboration with key national and international partners and stakeholders.

DCU has over 20,000 students in five faculties spread across three academic campuses in the Glasnevin-Drumcondra area of North Dublin. Thanks to its innovative approach to teaching and learning, the University offers a 'transformative student experience' that helps to develop highly sought-after graduates. DCU is currently No. 1 in Ireland for Graduate Employment Rate, and for graduate income (CSO).

DCU is a research-intensive University and is home to a number of SFI-funded Research Centres. The University participates in a range of European and international research partnerships. DCU is also the leading Irish university in the area of technology transfer as reflected by licensing of intellectual property.

As a 'People First' institution, DCU is committed to Equality, Diversity and Inclusion - a University that helps staff and students to thrive. The University is a leader in terms of its work to increase access to education, and is placed in the world's Top 10 for reducing inequalities in the Times Higher Education Impact Rankings.

### **Research Career Framework**

As part of this role the researcher will be required to participate in the DCU Research Career Framework. This framework is designed to provide significant professional development opportunities to Researchers and offer the best opportunities in terms of a wider career path.

## **Background & Role**

Chronic itch, medically known as pruritus, is a distressing skin sensation that prompts an irresistible urge to scratch. Unlike acute itch triggered by a temporary irritant, chronic itch persists for at least six weeks and often accompanies various skin conditions or underlying medical issues. It can significantly impact patient's quality of life, leading to sleep disturbances, anxiety, and depression. The exact cause of chronic itch is complex and varies widely. It can result from skin conditions such as eczema, psoriasis, or dermatitis, as well as systemic disorders like kidney or liver disease, neuropathy, or even certain cancers. Current treatments have insufficient efficacy or side effects, and do not treat the underlying cause of itch. Thus, there is a significant unmet medical need for a better efficacy, longer lasting and safer therapy.

Dr. Jianghui Meng is a Principal Investigator (PI) in Molecular Neuroscience and Neurotherapeutics at the School of Biotechnology, DCU. With funding from SFI, Sanofi, and LEO Pharma, Dr. Meng's research focuses on translational neuroscience and dermatology, specifically addressing type II inflammatory diseases and neurological disorders. The current research interests revolve around unravelling the mechanisms of chronic itch and pain signaling pathways, exploring their neuroimmune modulation, identifying therapeutic targets, and developing innovative analgesics and antipruritic therapies. The team's notable achievements include the discovery of the functional link between T<sub>H</sub>2 cells and sensory nerves through IL-31 and brain natriuretic peptide (BNP) signaling (<https://doi.org/10.1016/j.jaci.2017.12.1002>), the identification of the neuro-epidermal BNP-TRPV3-Serpin E1 pathway in atopic dermatitis (<https://doi.org/10.1016/j.jaci.2020.09.028>), the deciphering of a novel mechanism in IL-13-mediated epidermal-nerve communication (<https://doi.org/10.1016/j.bbi.2021.08.211>), and the discovery of key molecules (such as GSK3, STAT6, and CCL7) in pain/itch pathways within skin keratinocytes and Schwann cells (<https://doi.org/10.1016/j.jid.2022.07.028> ; <https://doi.org/10.1016/j.jid.2022.05.1087> ; <https://doi.org/10.1016/j.jid.2023.04.018> ). These findings have significant implications for developing effective treatments for chronic itch-related conditions and provide a strong foundation for the development of novel therapeutics for neurological diseases.

## **Role Profile**

A post-doctoral position in molecular neuroscience is available to progress a project funded by the LEO Foundation under the supervision of Dr. Jianghui Meng. The successful candidates will join the team to uncover the epidermal-nerve communication mechanism in the skin and identify pruritogenic molecules as well as develop itch therapeutics. Experience in molecular biology, nucleic acid extractions, bioinformatics, and dermatology are desirable for the candidate.

## **Principal Duties and Responsibilities**

Reporting to his/her Principal Investigator (PI) the Postdoctoral Researcher will:

- Be responsible for conducting a specified programme of research under the supervision and direction of the PI
- Design and implement research protocols; design safety procedures; adapt new procedures, methods or instrumentation relative to research procedures
- Preparation of samples for cell and molecular analysis and protein quantification and characterisation, and equipment maintenance; quality control analysis of reagents
- Collect, prepare and analyse research data; keep a detailed notebook summarizing experiments and recording research data; maintain computer database of research data; use graphics and statistical software to analyse and present data
- Be responsible for supervising other personnel in the laboratory to coordinate research efforts for increased efficiency; participate in training of fellows, visiting scientists, students and volunteer workers as needed
- Search pertinent scientific literature as needed and present at group or collaborator meetings
- Assist with ordering and procurement of supplies and equipment and with general maintenance of laboratory
- Support in identifying and developing future research and funding initiatives
- Engage in appropriate training and development opportunities as required by the PI, the School or Research Centre, or the University
- Engage in teaching and teaching support as assigned by the Head of School under the direction of the PI
- Be responsible for carrying out administrative work associated with the programme of research as necessary

### **Minimum Criteria**

- Applicants should have a PhD in basic science such as molecular neuroscience, cell & molecular biology, genetics, protein biochemistry, dermatology, or a closely related discipline.
- Experience in protein therapeutics, including the design development and production of plasmid vectors for the high-yield expression of biotherapeutic proteins in bacterial,
- Experience in Cloning, expression and purification of candidate proteins
- Experience in cell culture, immunohistochemistry, Western blotting, PCR, DNA preparation, RNA extraction, Q-PCR and related techniques, FACS, ELISAs
- Laboratory experience in some or all of the following areas: neuroscience, cell biology, molecular biology, biochemistry, histology, immunology
- Excellent written and oral communication skills
- Good organizational skills
- Strong problem-solving skills
- Candidates are expected to be highly motivated and work well with others

In addition, it is desirable that the candidate has experience in animal handling with rats, mice ; an appropriate record of scientific contributions to the field, such as publications or conference

contributions; experience in lab management; skills in time management; working simultaneously on different projects.

**Candidates will be assessed on the following competencies:**

**Discipline knowledge and Research skills** – Demonstrates knowledge of a research discipline and the ability to conduct a specific programme of research within that discipline

**Understanding the Research Environment** – Demonstrates an awareness of the research environment (for example funding bodies) and the ability to contribute to grant applications

**Communicating Research** – Demonstrates the ability to communicate their research with their peers and the wider research community (for example presenting at conferences and publishing research in relevant journals) and the potential to teach and tutor students

**Managing & Leadership skills** - Demonstrates the potential to manage a research project including the supervision of undergraduate students