Individual Research Project

ESR 6

THE PROJECT: Neuro-immune signalling in depression-induced chronic post-surgical pain

Objectives

1/ To examine the effect of chronic stress/depression on the development of chronic post-surgical pain in males and females using clinically relevant animal models.

2/ To examine neuronal and glial associated changes in the development and expression of chronic post-surgical pain associated with depression.

3/ To analyse the impact of pharmacological manipulation of the neuroimmune system on nociceptive responding and associated psychological changes (anxiety, depression and cognition) in the chronic post-surgical pain model.

Methodology

The successful candidate will work on a research programme that will employ an integrative, multidisciplinary, whole-systems neuroscience approach to elucidate the role of the neuroimmune system in preclinical models of relevance to depression and pain. A wide array of behavioural tests examining nociceptive responding and changes in affective responding will be examined. Neuronal and glial changes will be examined using RNA and protein analysis (RT-qPCR, RNA scope, Westernblotting, ELISA, Immunohistochemistry), optogenetics, electrophysiology and electromyography. Targeted pharmacological studies will determine if specific neuronal and/or glial signalling pathways underlie the changes in nociception and affective responding in the chronic post-surgical model.

Expected Results

This project will provide information on the role of the neuro-immune system on the development, expression and treatment of chronic post-surgical pain associated with depression. Given the higher incidence of both depression and chronic pain in females, this project will also examine if sex-differences exist in the neurobiology underpinning chronic post-surgical pain. The recruited researcher will be trained in and use state-of-the-art methodologies, learn about neurobiology of post-surgical pain, the psychobiology of affective processes, neuroimmune signalling and examine possible novel treatment targets for chronic post-surgical pain.

Supervisors and host organisations

Main supervisors and recruiting organisation:
Michelle Roche and David Finn
Physiology, Pharmacology and Therapeutics, School of Medicine, National University of Ireland Galway

Co-supervisor (academic partner):
Ipek Yalcin
CNRS, University of Strasbourg,
France

Co-supervisor (company):
Emile Andriambeloson and Stephanie Wagner
Neurofit, Strasbourg,
France

Planned mobility track and secondments:

NUI Galway, Ireland: M1-15, M32-36: Establish the stress-induced chronic post-surgical pain model in male and female rodents. Examine and pharmacologically target neuro-immune signalling to examine pathophysiology and treatment response in chronic post-surgical pain model.

HUS, France: M16-28: Electrophysiological and optogenetic investigations in stress-induced chronic post-surgical pain model

Neurofit, France: 29-31: Electromyography and/or cognitive alterations in the stress-induced chronic post-surgical pain model

Enrolment in Doctoral degrees:

National University of Ireland Galway and University of Strasbourg / Joint Diploma

THE POSITION

Duration

36 months

Salary

Living allowance €3780 per month (gross)

Allowance

Mobility allowance €600 per month.

Family allowance €500 per month

THE CANDIDATE PROFILE

Academic prerequisite

Candidates must hold a first class or upper second class honours MSc in a relevant biology-based subject (physiology, pharmacology, neuroscience, anatomy, biochemistry, biomedical science, or equivilent). A significant research experience (>6months) would be an advantage.

Knowledge on specific topics

Applicants must demonstrate a keen interest in pre-clinical research in the area of neuroscience and neuroinflammation relating to affective disorders and pain

Technical skills

Experience in at least two of the following is desirable: Behavioural neuroscience; pre-clinical (rodent) models of pain, stress, anxiety, depression; stereotaxic/small animal surgery; intracerebral microinjection; *in vivo* electrophysiology; immunohistochemistry/immunocytochemistry; RNAscope; FACS analysis of inflammatory cells/mediators; Western immunoblotting; ELISA; RT-qPCR; radioligand binding ; HPLC; Mass Spectrometry.

Exclusion criteria

Researchers can be of **any nationality**. However, the candidate **must not have resided** or carried out their main activity (work, studies, etc.) **in Ireland** for more than 12 months in the 3 years immediately before the recruitment date. Compulsory national service, short stays such as holidays, and time spent as part of a procedure for obtaining refugee status under the Geneva Convention1 are not taken into account.

The candidate shall, at the time of recruitment, be in the **first four years** (full-time equivalent research experience) of their research career and **have not been awarded a doctoral degree**.

Apply for this position at https://happy-form.u-strasbg.fr/
before the 1st August 2021