Individual Research Project

ESR 13

THE PROJECT

Determining new therapeutic targets in the comorbidity of depression and chronic pain

Objectives

1/ To investigate sex difference in the development of sensory hypersensitivity and secondary disorders (depression, anxiety and cognitive impairment) related to chronic pain. (UCA)

2/ To study the effect of optogenetic/chemogenetic manipulation of the vmPFC projecting to different LC neuronal subpopulations (noradrenergic/GABAergic) on sensory hypersensitivity and secondary disorders related to chronic pain. (UCA)

3/ To evaluate the electrophysiological properties of noradrenergic-LC and GABAergic-LC neurons in a mice model of neuropathic pain. (Patch-clamp technique, Ulaval/Doric)

4/ To discern the effect of the optogenetic stimulation of vmPFC- LC pathway on the electrophysiological activity of the different LC neuronal subpopulations (noradrenergic/GABAergic) in a mice model of neuropathic pain. (Extracellular recording in anaesthetized animals, Ulaval/Doric)

Methodology

Animal model of chronic pain and animal behavior

Optogenetic/chemogenetic approaches

Patch-Clamp and electrophysiological recordings in anaesthetized animals

Histology and inmunochemistry of LC and mPFC

Expected Results

Data will provide important insights into the role of vmPFC-LC pathway in the comorbidity of mood disorders and chronic pain in male and female mice. These data may reveal specific alterations in LC neuronal subpopulations predicting news therapeutic targets.

Supervisors and host organisations

Main supervisors and recruiting organisation:

Esther Berrocoso/Irene Suarez-Pereira
Neuropsychopharmacology and Psychobiology Research group
University of Cadiz-CIBER of Mental Health (CIBERSAM), Spain

Co-supervisor:
Yves De Koninck

Department of Psychiatry and Neuroscience,
University of Laval, Québec, Canada

Co-supervisor:

Jean-Luc Neron
Doric Lenses Inc, Québec, Canada

Planned mobility track and secondments:

Cadiz (Spain): Jan. 2022 to Apr. 2023 (16 months): neuropathic pain model in mice, stereotaxic surgery for viral vector administration for optogenetic/pharmacogenetic approaches, behavioral tests, histology and immunohistochemistry.

Laval (Canada): May 2023 to Apr. 2024 (12 months): Patch-clamp and electrophysiological recordings in anesthetized animals

DORIC (Canada): May 2024 to Jul. 2024 (3 months): Optimization of optogenetic tools.

Cadiz (Spain): Aug. 2024 to Dec. 2024 (5 months): Data analysis, writing of the thesis manuscript and defense.

Enrolment in Doctoral degrees:

University of Cadiz and Laval / Double Diploma

THE POSITION

Duration

36 months starting Jan. 1st 2022

Salary and allowance

The salary is competitive and complies with the MSCA Work Programme: approx. **2850 euros per month before taxes**, consisting of Living and Mobility allowance.

A conditional Family allowance of approx. 189 euros can be added to the salary.

Read about the employee/student accommodation benefits at the University of Cadiz and why the University of Cadiz is an excellent career choice: https://atencionalumnado.uca.es/alojamiento-oficina-de-alojamiento/.

THE CANDIDATE PROFILE

Academic prerequisite

- Hold a Master´s degree in relevant scientific disciplines, e.g. neuroscience, biomedicine, pharmacology, medicine
- Good/excellent academic performance
- Proficient in English (oral and writing)

Knowledge on specific topics

- Knowledge in pain and/or mood disorders

Technical skills

- Demonstrate previous experience in a research laboratory (e.g. basic wet lab methods)

Considered as advantage:

- Experimental animal course completed
- Experience in animal surgery, in vivo pharmacology, animal (rodents) behavior, immunodetection, microscopy, statistical data analysis

Exclusion criteria

Nationality is not a criterion: Researchers can be of **any nationality**.

1/ Rather the location of the researcher's residence or main activity during the 3 years prior to their recruitment is determining.
Indeed, the candidate **must not have resided** or carried out their main activity (work, studies, etc.) **in Spain** 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.*

For the present project, the recruitment date is Jan. 1st 2022.
Eligible candidates will hence have NOT spent more than 12 months in Spain between Jan. 1st 2019 and Jan. 1st 2022.

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

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