

Postdoctoral researcher (M/W): Pathogenic mechanisms of Alzheimer's disease.

Application Deadline : 30 September 2023

General information

Reference : UMR7051-MAUGRA-001

Number of position : 1

Workplace : MARSEILLE 05

Type of Contract : FTC Scientist

Contract Period : 24 months

Expected date of employment : 1 January 2024

Proportion of work : Full time

Remuneration : Between €2,932 and €4,669 gross per month depending on experience.

Desired level of education : Niveau 8 - (Doctorat)

Experience required : Indifferent

Section(s) CN : Molecular and cellular neurobiology, neurophysiology

Missions

Postdoctoral researcher responsible for the development and execution of experimental protocols in the context of research projects on the protein actors responsible for synaptic degeneration in Alzheimer's disease.

Alzheimer's disease (AD) is one of the greatest scientific and socio-economic challenges of the 21st century. Currently, there is no cure. Aggregates of amyloid- β and tau proteins, along with neuroinflammation/gliosis, are hallmarks of AD that lead to synaptic and neuronal loss as the basis for cognitive decline. The latter is closely related to the brain distribution of tau aggregates, strongly suggesting a link between tau accumulation and synaptic degeneration.

Brain apolipoprotein E (ApoE), primarily produced by astrocytes, is crucial for lipid transport to neurons and synaptic functions. The ApoE4 isoform is the most significant genetic risk factor for AD and contributes to tau-mediated neurodegeneration. Determining how ApoE4 controls tau-mediated synaptic degeneration is essential to understand AD and develop effective treatments, requiring a precise characterization of ApoE4 functions at the synaptic level in tau-damaged synapses.

As a result, the candidate will be involved in a project funded by the ATIP-Avenir program aimed at elucidating the protein partners of ApoE4 underlying tau-mediated synaptic degeneration in AD. To achieve this, the candidate will identify proteomic changes caused by ApoE4 in tau-damaged synapses, combining chemogenetic and proteomic approaches with synaptic resolution. The project involves working with genetically modified mice and analyzing brain phenotypes using proteomic, biochemical, molecular, cellular, and histopathological approaches.

Activities

- Injection of AAV viral vectors in mice.
- Pharmacological treatments in mice.
- Protein sample preparation for mass spectrometry, LC-MS analysis, and bioinformatics.
- Performing mouse interventions such as stereotaxic brain surgery, injections, sampling, labeling.
- Formatting of results and statistical analysis.
- Following the literature and improving/adapting techniques and analyses according to research projects.

Skills

- Hold a PhD in science, biotechnology, or pharmacological sciences and have research experience in one or more of these fields.
- Be a highly motivated and qualified individual with a strong interest in neuroscience (preferably in neurodegenerative diseases) and technical skills in mass spectrometry (proteomics) and/or biochemistry (click chemistry).
- Ability to analyze proteomic data using recommended software (Proteomic Discoverer, Maxquant/Perseus, etc.).
- Training in animal experimentation and surgery is recommended but not required.
- Knowledge of bioinformatics and programming languages (R, Matlab, Python) is highly appreciated but not mandatory.
- Excellent oral and written communication skills in English.
- Leadership, organizational, and interpersonal skills to work in groups and independently.

Work Context

The INP is a center of training and research that combines basic and translational research to study the organization, function and interaction of neural cells, as well as the molecular and cellular basis of major brain diseases. The INP is part of the Centre of Excellence in Neurodegeneration (CoEN) and offers an internationally competitive research environment with state-of-the-art facilities. The postdoc will be supervised by Dr. Maud Gratuze. The project will be developed at the Faculty of Medicine, located in the centre of Marseille, a few kilometers from the magnificent seafront, the Calanques National Park and the charm of inland Provence, all ideally suited to outdoor and cultural activities.