Universidad de Navarra

Facultad de Ciencias

MÁSTER EN INVESTIGACIÓN BIOMÉDICA

Research Project Proposal

Academic year 2024-2025

Instrucciones para completar el documento: Mantenga el mismo estilo de letra y formato.

This form must be filled in ENGLISH

Project Nº 39
Title: *Characterization of neuron populations in human brain using lipid imaging mass spectrometry*
Department/ Laboratory *"Grupo de Espectroscopía, Espectrometría y Materiales (GS$_2$M)"., Dep. of Physical Chemistry, Fac. of Science and Technology, University of the Basque Country (UPV/EHU).*
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Summary The human brain probably is the most complex and specialized organ. There is still a lack of knowledge regarding the number of nuclei and the cell populations that compose each nucleus. Such lack of knowledge hampers finding a cure for the many diseases that affect the brain. For example, the locus coeruleus (LC) is one of the first nuclei affected by Parkinson's disease (PD). However, not all neurons in LC are equally vulnerable to this disease. Some theories point to the neuromelanin that some of the neurons in the LC contain as a source of vulnerability, while others think that neuromelanin is a protector agent. Likewise, some of the neurons in substantia nigra (SN) are early affected by PD, while others seem to be more resilient. The reason behind such resistance is still not known. In this project, we will use lipid imaging mass spectrometry (LIMS) to map the neurons in one of these nuclei from a metabolic point of view. Combination of LIMS with high spatial resolution transcriptomics will allow us to determine for the first time the number of neuron populations in these nuclei and the connection between metabolism and disease vulnerability. This is an on-going project. Therefore, the precise task that the student will carry out will depend on when the student will incorporate. In any case, the student will be in charge of preparing the samples, scanning them using state-of-the-art equipment and data interpretation, using commercial and in-house made software.
<table><tr><td>yes</td><td></td></tr><tr><td>no</td><td>X</td></tr></table>Does the project include the possibility of supervised animal manipulation to complete the training for animal manipulator?