

### **1. SORIA-GOMEZ, EDGAR**

Project title: The role of CB1 receptors on memory and navigation

Project description: Students will learn different behavioral protocols to study memory and navigation. This will be combined with genetic and molecular approaches to target cannabinoid signaling. The participants will also have the opportunity to perform *in vivo* electrophysiology experiments in freely moving mice.

Affiliation: University of the Basque Country UPV/EHU, Achucarro Basque Center for Neuroscience.

Lab website: <https://www.achucarro.org/es/>

### **2. ENCINAS PÉREZ, JUAN MANUEL**

Project title: The Role of Reactive Neural Stem Cells and Aberrant Neurogenesis in Epilepsy

Project description: Neuronal hyperexcitation provokes dramatic changes in hippocampal neural stem cells and newborn neurons, which in turn contribute to the pathology of epilepsy. In our lab, using experimental mouse models, confocal and calcium imaging and electrophysiology we are continuously exploring the mechanisms underlying these alterations, as well as potential therapeutic approaches to prevent them. The lab is composed by several students, postdocs, senior researchers and a technician, and we are proud of our welcoming atmosphere.

Affiliation: Achucarro Basque Center for Neuroscience and Dept. of Neuroscience, University of the Basque Country (UPV/EHU)

Lab website: <https://www.achucarro.org/laboratory/neural-stem-cells-and-neurogenesis/>

### **3. CLEMENTE, DIEGO**

Project title: Analysis of histopathological affectation of the Central Nervous System in the context of experimental Multiple Sclerosis

Project description: The student will learn the induction and clinical evaluation of the experimental model of MS, experimental autoimmune encephalomyelitis (EAE), as well as the processing of the spinal cord and/or optic nerve, for histological analysis of the hallmark features of MS: demyelination, axonal damage and immune cell infiltration.

Affiliation: Neuroimmuno-Repais Lab. National Hospital for Paraplegics. Toledo (Spain)

Lab website: Autonomous University of Barcelona, Institute of Neuroscience

#### **4. ANDERO, RAUL**

Project title: Translational Mechanisms of Fear Memories

Project description: The laboratory of Raül Andero PhD is within the Institute of Neuroscience of the Autonomous University of Barcelona. The Andero Lab is interested in understanding sex differences in the molecular and cellular mechanisms underlying stress and fear memories through a translational research framework. For our studies, we employ multidisciplinary approaches and tools including animal models and behavioural paradigms, chemogenetic methods, calcium imaging in freely-moving mice and molecular and protein expression assays.

Visitor task: Tissue processing, immunohistochemistry of brain slices and microscopy.

Affiliation: Autonomous University of Barcelona, Institute of Neuroscience

Lab website: [www.anderolab.com](http://www.anderolab.com)

#### **5. GALVE ROPERH, ISMAEL**

Project title: Cannabinoid signalling impact in cortical development

Project description: Characterization of the neuronal and behavioral consequences of manipulating cannabinoid signalling during embryonic development. Immunofluorescence studies, gene expression analyses will be employed using different models: in vitro stem cell-derived neuronal cultures and/or in vivo genetic or pharmacological manipulation in wild-type or pathological conditions.

Affiliation: COMPLUTENSE UNIVERSITY, CIBERNED, IRYCIS

Lab website: [http://cannabinoidsignalling.com/?page\\_id=28916&lang=en](http://cannabinoidsignalling.com/?page_id=28916&lang=en)

#### **6. BOLAÑOS, JUAN PEDRO**

Project title: Exploring the bioenergetics of the neural cells

Project description: The student will develop a week stay to get training on:

1. Bioenergetic profiling of astrocytes and neurons using the Seahorse technology.
3. Isolate mitochondrial fraction from astrocytes and neurons.
4. Blue native gel electrophoresis (BNGE) of mitochondrial respiratory chain.

6. Mitochondrial reactive oxygen species (mtROS) assessment by flow cytometry.

Affiliation: UNIVERSITY OF SALAMANCA

Lab website: <https://ibfg.usal-csic.es/juan-pedro-bolanos-en.html>

### **7. ASTIZ, MARIANA**

Project title: Cross-talk between neurons and astrocytes within the master clock circuit in the hypothalamus.

Project description: The student will co-culture hypothalamic neurons and astrocytes and use various genetic manipulation tools to study *in vitro* how these cells talk to each other and coordinate the ticking of the central clock. We will use real-time high-resolution confocal imaging and image analysis software to evaluate communication mechanisms.

Affiliation: Achucarro Basque Center for Neuroscience

Lab website: <https://www.achucarro.org/laboratory/circadian-physiology-of-neurons-and-glia/>

### **8. DE CASTRO, FERNANDO**

Project title: CNS myelin as effector of brain plasticity in physiological conditions and pathologies

Project description: Students will learn modern approaches to study central myelin (development, adaptation in normal adult, reaction to demyelinating scenarios). We use morphological approaches, murine models of demyelination (EAE, cuprizone), primary cultures of OPCs, glial mixt cultures and organotypic cultures (cerebellum slices, both normal and demyelinated).

Affiliation: Instituto Cajal-CSIC

Lab website: <http://www.cajal.csic.es/departamentos/fernando-decastro/fernando-decastro.html>

[www.GNDe.es](http://www.GNDe.es) (*remodelling*)

### **9. ASO, ESTER**

Project title: In vitro evaluation of the pharmacological effects of THC on the interaction between CB1, A2A and D2 receptors

Project description: By using luminescence-based assays, students will evaluate the effects of THC, the main psychoactive component of cannabis, on the capacity of CB1, A2A and D2 receptors to form heteromers and on their functionality. For doing so, they will transfect HEK-

293T cells with different cDNA constructs and will quantify bioluminescence signals and second messengers.

Affiliation: Department of Pathology and Experimental Therapies, School of Medicine and Health Sciences, University of Barcelona

Lab website: <http://www.ub.edu/neuropharmpain/>

#### **10. KUKLEY, MARIA**

Project title: Imaging the glial cells in mouse model of spinal cord injury

Project description: *The student will learn to prepare spinal cord slices from mice with spinal cord injury, and to image the oligodendrocyte lineage cells in these slices, studying their morphology and calcium signaling. Laser scanning microscopy will be used. The student will get insights into the mouse model of spinal cord injury and behavior of glial cells in this model.*

Affiliation: Achucarro Basque Center for Neuroscience

Lab website: <https://www.achucarro.org/laboratory/neuronal-and-glial-physiology/>

#### **11. VIEITES PRADO, ALBA**

Project title: Whole-brain activity mapping in the adult mouse

Project description: The students will map neuronal activity across the entire mouse brain using light-sheet datasets obtained from mice subjected to different experimental conditions. As part of the project, students will be introduced to tissue clearing and light-sheet microscopy, and will learn how to use ClearMap for automated 3D image analysis.

Affiliation: CIMUS – University of Santiago de Compostela

Lab website: <https://www.usc.es/cimus/es/investigacion/grupos-de-investigacion/brain-plasticity>

#### **12. AGUSTÍN-PAVÓN, CARMEN**

Project title: Neural basis of social dysfunction in the *Mecp2*-mutant mouse model of Rett syndrome

Project description: The student will be trained in behavioural analysis using state-of-the-art tracking programs, and subsequently in the preparation of brain samples from mutant mouse models: freezing microtomy and immunofluorescence. They will carry out the analysis of these preparations by confocal and fluorescence microscopy, and image analysis.

Affiliation: Dept Biología Cel·lular, Biología Funcional i Antropología Física,

Facultat de Ciències Biològiques, Universitat de València

Lab website: <https://www.uv.es/oct-agroalimentacio/ca/grups-investigacio/cercador-1286220319546/GrupsInves.html?id=1286232326389>

### **13. KUKLEY, MARIA**

Project title: Testing new pro-regenerative compounds in spinal cord injury model

Project description: *The student will learn to prepare spinal cord slices from mice with spinal cord injury. The animals will receive pharmacological treatment that is potentially pro-regenerative. The student will learn to image neurons and glia in slices and to evaluate the effects of pharmacological compounds on tissue recovery. Laser scanning microscopy will be used. The student will get insights into the mouse model of spinal cord injury and into testing the new pharmacological compounds for treatment.*

Affiliation: Achucarro Basque Center for Neuroscience

Lab website: <https://www.achucarro.org/laboratory/neuronal-and-glial-physiology/>

### **14. LLORENS-MARTIN, MARÍA**

Project title: Identification of neural stem cells, neuronal and glial markers in the human brain

Project description: ECRs will acquire skills in human brain tissue processing and immunohistochemistry (IHC) procedures. They will establish criteria to reliably validate antibody signal and perform unbiased stereological cell counts using confocal microscopy. These techniques are applicable to a variety of IHC studies performed on other tissues of human (or animal) origin.

Affiliation: Centro de Biología Molecular Severo Ochoa. Spanish Research Council

Lab website: <https://llorenslab.cbm.uam.es/>

### **15. AL-MASSADI, OMAR**

Project title: Melanin-concentrating hormone (MCH) regulation of dorsal raphe nuclei (DRN): a link between food intake, energy expenditure and anhedonia

Project description: Students will evaluate the effect of repeated local DRN MCH administration on energy metabolism and depressive like-responses by using stereotaxic surgery, implantation of microinfusion pumps, assessment of food intake/energy expenditure and sucrose preference test. Also, will receive training in the design of lentiviral silencing of MCH-R1 expression in serotonergic neurons.

Affiliation: Health Research Institute of Santiago de Compostela (IDIS)

Lab website: -

#### **16. NAVARRETE, MARTA**

Project title: Characterization of the physiological consequences of astrocyte-to-neuron ensembles on local neuronal excitability

Project description: This course provides students with the opportunity to explore the Ca<sup>2+</sup> dynamics of astrocytes using cutting-edge fiber photometry techniques during animal behavior. By processing the data with state-of-the-art image processing software, students will be able to compare and comprehend the events and factors that play a role in the communication between astrocytes and neurons. Through this hands-on learning experience, students will deepen their understanding of in vivo communication between neurons and astrocytes in mice, as well as gain proficiency in advanced imaging and optogenetic methods.

Affiliation: Cajal Institute, CSIC

Lab website: <https://webpre.cajal.csic.es/laboratorios/plasticidad-sinaptica/index.html>

#### **17. OZAITA, ANDRÉS**

Project title: Study of the inflammatory phenotypes of microglia and its modulation by cannabinoids using immunofluorescence approaches in mouse brain samples.

Project description: The brain's microglia population is relevant to maintain homeostasis and it is also associated to the release of proinflammatory and anti-inflammatory cytokines relevant for brain function. We will study whether compounds acting on cannabinoid receptors modulate microglia's morphology since changes in cell morphology are associated to different roles of microglia.

Affiliation: Universitat Pompeu Fabra

Lab website: [www.upf.edu/neurophar](http://www.upf.edu/neurophar)

#### **18. DEL PINO PARIENTE, ISABEL**

Project title: Visualization, 3D reconstruction and analysis of neural morphology in the mouse cerebral cortex.

Project description: Students will learn how to fluorescently label neurons and perform post-hoc immunohistochemistry in acute brain slices of adult mice. Subsequently, imaging and reconstruction of the morphology of glutamatergic or GABAergic within the cerebral cortex will be performed using confocal imaging. Data will then be visualised using state-of-the-art image processing software. The student will get an insight into neural morphology and identity, dendritic architecture, developmental neurobiology and fluorescent imaging.

Affiliation: Instituto de Neurociencias, CSIC-UMH

Lab website: [www.delpinolab.com](http://www.delpinolab.com)

### **19. SOLAS, MAITE**

Project title: Impact of astrocytic insulin receptor ablation on Alzheimer's disease

Project description: Preliminary data obtained by our group has shown that GLUT1 deletion in astrocytes promotes insulin receptor (IR) overexpression. This data indicates that insulin signaling and astrocyte mediated glucose uptake could be closely linked. The aim of the present project is to assess if IR reductions in astrocytes can induce alterations in GLUT1 levels and therefore, cause changes in glucose uptake, modulate the astrocyte-neuron crosstalk, and consequently, reprogram neuronal activity inducing detrimental effects in AD. Student will study this issue by two photon imaging and fiber photometry studies.

Affiliation: University of Navarra, Department of Pharmacology and Toxicology

Lab website: <https://www.unav.edu/web/departamento-de-farmacologia-y-toxicologia>

### **20. LABANDEIRA GARCIA, JOSÉ LUIS AND RODRIGUEZ PALLARES, JANNETTE**

Project title: Neurodegeneration and neuroprotection in Parkinson's disease

Project description: Neurodegeneration and neuroprotection in Parkinson's disease

Affiliation: Students will have the opportunity to participate in ongoing studies focusing on understanding the role of renin-angiotensin system in neurodegeneration and neuroprotection of dopaminergic neurons in both in vitro and in vivo models of Parkinson's disease, using different cell and molecular biology techniques (WB, qPCR, HPLC, IHC/IF, microdissection, etc.). Predoctoral (or postdoc) researchers are preferred, and the period of the stay will be September, although July could also be considered.

Lab website: <https://www.usc.es/cimus/es/investigacion/grupos-de-investigacion/cell-and-molecular-neurobiology-parkinsons-disease>