Early Career Training Programme Host Laboratories

Location	Institution	Principal Investigator	Project Title	Project Description
Alicante, ES	[Instituto de Neurociencas](#)	Eloisa Herrera	Generation and Regeneration of Bilateral Circuits	The student will become familiar with in utero electroporation techniques, neuronal tissue explants, axon growth and guidance assays, confocal microscopy, time-lapse imaging, brain clearing, data analysis, etc.
Alicante, ES	[Instituto de Neurociencias](#)	Jose P. Lopez-Atalaya	Microglia and inflammation in Alzheimer's Disease	Student will assess inflammatory response in acutely isolated microglia from mouse model of Alzheimer's disease (APP/PS1) by using RT-qPCR.
Alicante, ES	[Instituto de Neurociencias](#)	Encarni Marcos	Neural mechanisms of Behavior	Our research goal is to unravel the neural mechanisms underlying decision making, with the aim of describing the brain networks regulating this critical process and of developing a theoretical framework. The visiting researcher will be involved in optogenetics experiments, manipulating the activity of specific areas within the prefrontal network of mice, with the goal of describing the interaction between those brain areas and their role in decision making.
Alicante, ES	[Instituto de Neurociencias](#)	Felix Viana	Calcium imaging of nociceptive responses in mouse neuronal cultures	Students will learn to dissect primary sensory neurons from adult mice, prepare them for short term culture and study their chemical and thermal responses to TRP channel agonists
Alicante, ES	[Instituto de Neurociencias](#)	Angel Barco	Investigation of neuronal activity-driven transcription and chromatin changes	The student will learn various techniques essential for analyzing changes in gene expression and chromatin profiles within the context of different plasticity paradigms.
Alicante, ES	[ISABIAL](#)	Jose A. Gomez-Sanchez	Visualisation of Myelin Using Volume Electron Microscopy (Array Tomography - AT-SEM)	This project explores the structural organisation of myelin in peripheral nerves using Volume Electron Microscopy (AT-SEM). The student will learn to perform array tomography, sample preparation, and data analysis, providing insights into myelin architecture and the associated cellular interactions.
Barcelona, ES	[Autonomous University of Barcelona, Institute of Neuroscience](#)	Raul Andero	Translational Mechanisms of Fear Memories	Students will experience a research environment integrating human and mouse data in fear experiments, ranging from participating in human fear conditioning studies to performing immunohistochemistry on mouse brains.

Barcelona, ES	[Centre de Recerca Matemàtica](#)	Alexandre Hyafil	Modelling behavioral data from decision-making task	Students will model behavioral data, ideally collected in their own lab, using modelling approaches that follow standard models in the field (e.g. Reinforcement learning, drift-diffusion model, latent model, regressions) but taylored to the cognitive operations at play during the task. Our lab runs a summer school in Barcelona dedicated to these techniques right after FENS, see www.bambschool.org
Barcelona, ES	[Hospital Del Mar Research Institute](#)	Manuel Valero	Supervised Classification of Interneuron Classes from Large-Scale Extracellular Recordings	Students will gain expertise in cutting-edge methods developed in our lab for the supervised identification of all major cortical neuron classes in vivo, as well as in analyzing interclass functional connectivity using our open dataset from behaving mice.
Barcelona, ES	[Institut de Neurociències](#)	Elena Martín García	Neurobiological mechanisms of addiction	The question we address in this work is to study the neurobiological bases of cannabis addiction using a chemogenetic technique (also known as Designer Receptors Exclusively Activated by Designer Drugs, DREADD), with a dual vector approach (or retro-DREADD approach) that involves selectively controlling specific neural pathways in the brain. A distinguishing feature of addiction is compulsive behavior, which is observed only in a subpopulation of individuals. However, the neurobiological mechanisms underlying vulnerability or resistance to compulsive-like behavior remain unknown. It is believed that the medial prefrontal cortex (mPFC) plays a crucial role in the addiction cycle, as its function in inhibitory control is altered. It has been postulated that the neural circuit from the mPFC to the nucleus accumbens (NAc) plays a major role in vulnerability and resilience to developing addictive behavior. The specific aim of this work is to study the involvement of these glutamatergic projections in the loss of control over cannabis use by using the retro-DREADD approach for the chemogenetic control of this specific circuit. To this end, in the retro-DREADD approach, we will express the inhibitory DREADD 'hM4Di' regulated by the CamKII promoter in the mPFC (prelimbic region, layer 5) of WT mice and the retrograde adeno-associated virus (AAV) expressing Cre in the NAc Core. We will chronically activate the DREADD receptors with clozapine-N-oxide (CNO), using subcutaneously implanted minipumps, to produce hyperpolarization (caused by the inhibitory DREADD 'hM4Di') of the neurons in the mentioned circuit.
Barcelona, ES	[Institut de Neurociencies](#)	Clara Penas	Analysis of lesion volume and glial reactivity after central nervous system trauma	Students will learn how to determine lesion spreading and glial reactivity after spinal cord and brain stroke injuries in mice. The student will be

				able to recognize lesion site, neuronal sparing, astrocyte and microglial reactivity.
Barcelona, ES	Universitat Autònoma de Barcelona	Esther Udina	Axonal regeneration after nerve injuries in mice	Students will have the opportunity to see the surgical procedures to injury a peripheral nerve in mice, and learn different histological approaches to evaluate axonal regeneration.
Barcelona, ES	University of Barcelona- School of Medicine	Silvia Gines Padros	Detection of cannabinoid receptor 1 in mitochondria in Huntington´s disease models	Students will isolate mitochondria from various tissues and cell types in both HD and WT mouse models. Using a combination of biochemical, cellular biology, and metabolomic techniques, they will assess the expression and functional activity of the CB1 receptor (CB1R).
Barcelona, ES	Vall Hebron Institute of Research	Marta Vila-Pueyo	Assessing the role of glial cells in preclinical models of migraine	This project will be based on studying the role of glial cells in migraine pathophysiology by using a preclinical model of chronic migraine in mice. We will investigate differences in the activation of glial cells between chronic migraine vs control mice by assessing changes in protein expression using fluorescent immunohistochemistry. First, the chronic migraine model will be pharmacologically induced in mice. Then, behaviour tests will be used to assess the development of a migraine-like phenotype in mice . Once the model has been established, tissue from central and peripheral nervous systems will be collected. Finally, immunohistochemistry will be used to characterize the expression of markers of glia activation and plasticity.
Basque Country, ES	Universidad del País Vasco	Carlos Matute	Assessing myelin aging	The trainee will study changes in lipid content during aging using fluorescence and electron microscopy. He/She will learn histology and high resolution imaging techniques.
Ciudad Real, ES	Neurophysiology and Behavior Lab, University of Castilla La-Mancha. Faculty of Medicine, Ciudad Real, Intitute of Biomedicine,	Lydia Jiménez-Díaz and Juan D. Navarro-López	The role of amyloid pathology and neural excitability in the early stages of Alzheimer's disease	Students will explore early-stage Alzheimer's disease in a murine model, focusing on the effects of amyloid pathology. They will gain hands-on experience with advanced techniques, including stereotaxic surgery, in vivo and ex vivo electrophysiology, histology, proteomics, and behavioral analysis, while deepening their understanding of the disease's underlying mechanisms.
Leioa, ES	Achucarro Basque Center for Neuroscience	Edgar Soria-Gomez	Cannabinoid regulation of cognitive functions	The student will participate in behavioral protocols coupled to in vivo recordings of cellular activity.
Madrid, ES	Instituto Cajal	Gertrudis Perea	Role of astrocytes in social behavior	Astrocytes, a subtype of glial cells, provide important metabolic and trophic support to neurons, synapse and neuronal homeostasis.

Madrid, ES				However, it remains unexplored whether astrocytes can be activated by social interactions and the potential impact of astrocytic signaling to the social coding.
Madrid, ES	[Instituto Cajal](#)	Marta Navarrete	Characterization of Functionally-Adapted Astrocytic Ensembles in Memory Encoding	Students in this program will investigate Ca2+ dynamics in astrocytic ensembles during animal behavior, using advanced fiber photometry, AstroLight techniques, and image processing tools. This hands-on experience enhances their understanding of astrocyte-neuron communication in vivo and builds skills in cutting-edge imaging and optogenetics.
Madrid, ES	[Centro de Biología Molecular Severo Ochoa](#)	Paola Bovolenta	Role of SFRP1 in choroid plexus function during degeneration	Students will be involved in the generation of choroid plexus organoids and their characterization using different molecular and cellular apporaches
Madrid, ES	[Centro de Biología Molecular Severo Ochoa](#)	Jose J. Lucas	Bioinformatic Approaches for RNAseq Analysis in Neurodegenerative and Psychiatric Disorders	The student will become familiar, among other things, with bioinformatic tools for RNAseq analysis in order to detect alterations in patient samples and animal models of neurodegenerative and psychiatric diseases, especially Huntington's disease and autism.
Madrid, ES	[Instituto Cajal](#)	Pablo Méndez García	Sex differences in hippocampal physiology	The student will participate in experiments aimed at recording with electrophysiological or optical techniques the activity of neurons in awake, behaving rodents. The student will be introduced to the analysis of recorded activity.
Madrid, ES	[Instituto Cajal](#)	Francesco P. Ulloa Severino	The role of astrocyte morphology in brain circuits and motor control	Students will inject novel constructs to label astrocytes with different fluorophores and analyze their morphology using confocal and expansion microscopy.
Madrid, ES	[Instituto Cajal](#)	Fernando de Castro	Oligodendrogliogenesis, myelination, demyelination and remyelination: all in one lab...!	Our group studies oligodendrocytes and the formation of CNS myelin from development to the adult, as well as the cellular and molecular mechanisms involved in this (studied in vivo and in vitro). We are also interested in physiopathogenic mechanisms of demyelination (animal models of multiple sclerosis and rare leukodystrophies) and explore ways to design/test compounds that would improve spontaneous remyelination in diseases like multiple sclerosis and rare leukodystrphies.
Madrid, ES	[Centro de Biologia Molecular Severo Ochoa](#)	María Dolores Ledesma	Effects of oxylipin alterations in the synapsis of acid sphingomyelin knock out neurons	Students will modulate oxylipin levels in neurons and synaptosomes from wild type and acid sphingomyelinase mice and see the effects in neurotransmission. The student will learn to prepare primary neuronal

				cultures and synaptosomes and analyze synaptic proteins by microscopy and biochemical means.
Madrid, ES	[Universidad Rey Juan Carlos](#)	Raquel Abalo	Short- and long-term effects of cancer chemotherapy on the brain-gut axis	Students will train on the analysis of gastrointestinal motility, using non-invasive radiographic methods, and that of the enteric nervous system, using whole-mount preparations of the myenteric plexus, to evaluate the impact of cancer chemotherapy on both myenteric neurons and glial cells, underlying the changes in motility. The methods and results of different visceral pain experiments and the analysis of brain structures and DRG will also be shown.
Pamplona, ES	[University of Navarra](#)	Maite Solas	Studying astrocytic calcium dynamics	The student will be involved in fiber photometry studies to analyze astrocytic calcium dynamics in Alzheimer's disease pathology.
Salamanca, ES	[Universidad de Salamanca](#)	Arantxa Tabernero (Project supervisor: Myriam Jaraiz-Rodriguez)	Study of the effects of the peptide TAT-Cx43 in the neurovascular unit components	Students will explore the effects of a cell-penetrating peptide based on the connexin43 protein in the neurovascular unit: endothelial cells, pericytes and other cells in the context of glioblastoma. The student will learn about glioblastoma, the most common primary brain cancer and therapeutic approaches targeting tumour microenvironment.
Santiago de Compostela, ES	[Universidade de Santiago de Compostela](#)	Jannette Rodríguez Pallares	Neurobiology of Parkinson's disease	Studies of neurodegeneration, neuroprotection and cell therapy in experimental models of Parkinson's disease
Santiago de Compostela, ES	[Universidade de Santiago de Compostela](#)	JL Labandeira García	Mechanisms responsible for dopaminergic neuron degeneration and the development of new therapeutic strategies for Parkinson's disease	Cellular and molecular mechanisms involved in the degeneration of dopaminergic neurons in Parkinson's disease: neuroprotection, neurodegeneration, neurogenesis and early markers.
Sevilla, ES	[Instituto de Biomedicina de Sevilla (IBiS)](#)	Alberto Pascual	Microglial metabolism in health and disease	Characterise the different metabolic status of microglia in physiology and pathology using primary microglial cultures and genetically modified models.
Sevilla, ES	[Universidad de Sevilla](#)	Patricia González Rodríguez	Bioenergetic and metabolic dysfunction in Parkinson Disease	Students will work with Parkinson's disease models at both prodromal and symptomatic stages. They will gain hands-on experience with two-photon imaging, fluorescence imaging techniques, in vivo brain slice electrophysiology, and behavioral analysis
Sevilla, ES	[Universidad de Sevilla](#)	Sara Morcuende	Effects of boldine in healthy ageing	During their short stay at our lab, students will acquire hands-on experience with various behavioral and molecular techniques in mice. These include novel object recognition, rotarod, immunofluorescence,

				and western blot. The aim is to investigate the beneficial effects of the phytochemical boldine on the nervous and muscular systems.
Toledo, ES	[National Hospital for Paraplegics](#)	Juliana M Rosa	Astrocytic enconding of sensory modalities	Students will work on in vivo imaging of neuron-astrocyte activity in freely moving animals using miniaturized microscopes. He/she will be trained in viral strategies, performing in vivo experiments with miniscope, behaviour tests for sensory detection and data analysis.
Toledo, ES	[National Hospital for Paraplegics.](#)	Diego Clemente	Anlysis of the neuroinflammatory context of Multiple Sclerosis: from blood to brain.	Student will learn the study of the components of central and peripheral immune system in the context of the neurodegenerative disease multiple sclerosis.
Valladolid, ES	[Excellence Unit Institute of Biomedicine and Molecular Genetics of Valladolid (IBGM)](#)	Víctor Tapias	The Synergistic Interaction of α-Synuclein and Tau in Neurodegeneration	The student will inject an AAV expressing A53T human α-synuclein in the hippocampus of Tg P301S tau mice to study the molecular and biochemical synergistic interaction between α-syn and tau. Techniques: mouse husbandry, genotyping, stereotaxic surgeries, immunohistochemistry, confocal laser microscopy and Western blotting.
Aveiro, PT	[Universidade de Aveiro](#)	Diogo Trigo	Mitochondrial transplantation for neuroregeneration	Intercellular mitochondria transfer has been demonstrated in the brain and is established as a potential neuroprotective mechanism in a range of neurological conditions, but its therapeutic application in mitigating age-related oxidative stress damage and neurodegeneration remains unmet. This project aims to dissect horizontal mitochondrial transfer between neurons and other cells
Faro, Algarve, PT	[UALG/ABC-Ri](#)	Clévio Nóbrega	Connecting mutant ataxin-2 and synaptic dysfunction, are stress granules the link?	This project aims to establish a direct link between stress granules (SGs) and neurodegeneration in Spinocerebellar Ataxia Type 2 (SCA2), identifying whether SG modulation can be a therapeutic target. Through a combination of molecular, cellular, and in vivo approaches, we will investigate how SGs contribute to disease progression and whether manipulating their formation can mitigate neurodegeneration.
Lisbon, PT	[NOVA Medical School](#)	Claudia Almeida	Imaging synapse dysfunction in Alzheimer's disease	The student will learn advanced microscopy techniques and bioimaging analysis to characterize synapse dysfunction in mouse and human cultured neurons.
Porto, PT	[FMUP, University of Porto](#)	Patricia Monteiro	From genes to behavior in mice: decoding neural brain circuits involved in neuropsychiatric disorders	Students in our lab explore how genetic mutations linked to neuropsychiatric disorders impact brain circuits and behavior in mice. Using cutting-edge techniques like optogenetics, electrophysiology, and behavioral assays, students investigate neural mechanisms

| Porto, PT | Center for Drug Discovery and Innovative Medicines (MedInUP) and [RISE-Health Research Network, ICBAS - University of Porto](#) | Paulo Correia-de-Sá | Role of microglia and ADP-sensitive P2Y12 receptor polymorphisms in human epileptogenesis | Prolonged microglial activation and cytokine release are associated with increased synaptic activity, thus indicating an intimate relationship between neuroinflammation, neuronal sprouting and epileptic activity. This prompted us to investigate the role of microglia and neuroinflammation in epilepsy by analysing the expression of microglial-specific receptors, like the ADP-sensitive P2Y12 receptor and the CX3CL1/CX3CR1 signaling pathway, in the hippocampus and neocortex of patients with Mesial temporal lobe epilepsy with hippocampal sclerosis (MTLE-HS) by RT-PCR and confocal micorscopy (see 10.3389/fncel.2022.910662; 10.1111/epi.13263; 10.1007/s11302-016-9535-2). |