

**Subject: PhD position to study neural representations of spatial memory in freely moving mice.**

Project Title: Neuronal representations of spatial memories: immune ablation of synaptic mechanisms of memory formation as an animal model of memory malfunction.

Keywords: working memory, neural activity, cortical micro-circuit, NMDA receptors, calcium imaging, animal behaviour, quantitative data analysis

Project description: This is a unique opportunity for a strongly motivated candidate interested in studying how information is stored long-term in the brain.

The candidate will develop a set of read-outs to measure how memories are generated, retained and recalled utilizing calcium imaging data and animal behavioral readouts. The behaviour will be combined with a cutting-edge large-field calcium imaging technology to simultaneously monitor the activity of a large number of individual neurons distributed over many days. Using our recently established reversible antibody-mediated disruption of NMDA receptor function in mice (Planagumà et al 2015) we will characterize at the behavioural and neural circuit levels, the mechanisms of memory formation and recall during normal and malfunctioning brains. The candidate will perform quantitative analyses of large data sets using methods from modern statistical analysis and machine learning.

The project will be developed within a collaboration between several investigators in IDIBAPS (Barcelona): Josep Dalmau, MD, PhD, Jaime de la Rocha PhD, Albert Compte PhD and Pablo Jercog PhD. Together, these labs have a strong publication record investigating the neural circuit basis of different types of memory formation mechanisms and synaptic receptor mediated autoimmune brain pathologies, and they have extended experience in Calcium imaging, electro-physiology, analysis of behavioural/neuronal data sets and computational modeling.

The project is supported by CELLEX foundation and will be developed at IDIBAPS, a public biomedical research institute whose mission is to encourage Systems Neuroscience, translational research, and technological progress in the field of Biomedicine. The candidate will enroll in the Biomedicine PhD program of the University of Barcelona, one of the most exciting cities to develop a broad range of biotechnologies in Europe.

Candidate profile: Candidates with a very good track record in their undergraduate degree (e.g. physics, math, bioinformatics, bioengineering), a Master's in a neuroscience-related discipline and with an interest in cognition, and advanced data analysis techniques are encouraged to apply. Candidates with good oral and written skills in English will be given preference. Previous experience with neuroscience data analysis or programming (Matlab, Python, etc.) will be highly valued.

Applications should be addressed to Pablo Jercog ([pjercog@gmail.com](mailto:pjercog@gmail.com)) with the subject: "predoctoral position" and include a: **Statement of Research Interest and CV and 1-2 referees information.**

Candidates will be evaluated starting in March 1st 2019 and until the position is filled. Estimated starting date: between May and September 2019.

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