

We are seeking to recruit a **post-doctoral fellow** or an **engineer** for one year (with one year possible extension) in the framework of a collaboration between the groups of Cathie Ventalon (IBENS) and Michaël Zugaro (CIRB, Collège de France, http://zugarolab.net). Our groups are located in the historic center of Paris and characterized by a diversity of backgrounds (physics, biology, engineering) and a friendly atmosphere.

The scientific project focuses on the development of novel **calcium imaging** methods to record neuronal activity in **freely-behaving mice**, in order to investigate **hippocampal dynamics** underlying learning and memory. We have developed a fiberscope that allows for fast fluorescence confocal imaging (**100 Hz**) of GCaMP indicators during behavior and sleep. Building upon our prototype described in [1], our fiberscope can measure place fields and their evolution during multiple imaging sessions.

The candidate will extend the capacities of the fiberscope in two successive directions:

- Consolidate our recent developments leveraging the fast kinetics of **GCaMP8**, in order to reliably image fast hippocampal sequences during memory encoding and consolidation across successive learning days. Recordings will be compared between our fiberscope and a standard miniscope.
- Our optical system has the unique capability to perform **targeted photoactivation** simultanesouly with functional imaging. We will explore the ability to measure place coding using red calcium indicators (eg jRGECO1a) and combine it with targeted excitation or inhibition of specific cells using blue optogenetic actuators.

Expected expertise:

- Brain surgery in mice (AAV injections, implantation of chronic windows, implantation of extracellular electrodes)
- Recording neuronal activity using calcium imaging and electrophysiology (LFP)
- Animal training
- Data analysis

Selection will be open until the position is filled. Applicants should send their CV, a cover letter detailing their research experience and interests, and two letters of reference (cathie.ventalon@ens.psl.eu and michael.zugaro@college-de-france.fr).

Recent publications

1 Dussaux et al. (2018), Scientific Reports 8:16262.

2 Oberto et al. (2021), Current Biology 32:1-13.e6.

3 Todorova and Zugaro (2019) *Science* 366:377-81

4 Drieu et al. (2018) *Science* 362:675-9