

OPEN POSITION for laboratory engineer (Ingénieur d'Etude)

All optical investigation of brain circuits with optogenetics and wave front shaping

The Wave front engineering microscopy group at the Neurophotonics Laboratory (<http://neurophotonics.parisdescartes.cnrs.fr>) in Paris has an open position for a 2-3 years laboratory engineer (**Ingénieur d'Etude**). The candidate will assume a key role in a research project recently financed by the NIH in the framework of the 'BRAIN' (Brain Research through Advancing Innovative Neurotechnologies) initiative.

Understanding communication between neurons, who is talking to whom, and what language they are speaking, is essential for discovering how brain circuits underlie brain function and dysfunction. Over the past decades, neuroscience has made exponential progress toward recording and imaging communication between neurons. In addition, geneticists have recently developed the capability to manipulate neurons with light through the expression of light-activated proteins called "opsins". The use of these new tools requires sophisticated illumination methods. In the past years, the Wave front engineering microscopy group has pioneered the use of wave front shaping approaches (computer generated holography, generalized phase contrast, temporal focusing) to deliver patterned light into brain tissue thus enabling simultaneous activation of multiple neurons and independently controlling the strength and timing of light targeted to each cell. In this project, we aim at characterizing newly developed opsins to determine which are best suited for wave front shaping techniques, implement wave front shaped patterns in three-dimensions and validate the use of the system in collaboration with neuroscientists studying circuits in optically and physiologically diverse neural systems.

Job profile

The candidate will participate in developing an experimental strategy enabling all optical brain control by combining optogenetics photostimulation and Ca^{2+} imaging. This will require the screening of different optogenetic compounds and different combination of optogenetics actuators and reporters to determine the optimal combination enabling investigation of brain circuits with millisecond temporal precision and single cell resolution.

The screening will involve the use of viral injections, in vitro preparations, electrophysiological recordings and calcium imaging.

The candidate will be also responsible of the organization and management of lab stocks.

Requirements:

We are seeking a candidate with a Master or equivalent in neurobiology, biophysics, or related field with a demonstrated experience in: viral injections, cell cultures, cell primary cultures, immunohistochemistry, genotyping.

Experience in optical imaging and electrophysiology is welcome but not mandatory.

Contract duration:

2-year renewable

Salary (net)

20,000 -26000 /yea depending on candidate experience

How to apply

Application must be sent to: valentina.emiliani@parisdescartes.fr

Please include the following information:

- CV
- Brief summary of previous activity
- Contact information of two referees

Contact information

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