-Fall/Winter 2021- Postdoctoral position: all-optical connectivity mapping of the respiratory rhythm generator

We are looking for a postdoctoral fellow to join a multidisciplinary collaborative project (rhytHmOLOG) between Dr Gilles Fortin at the Institut de Biologie de l'Ecole Normale Supérieure (IBENS) and Dr. Valentina Emiliani at the Institut de la Vision (IdV), two nearby research institutes in central Paris, France. The project, relevant to motor system neuroscience, will aim to perform all-optical high throughput connectivity mapping of the respiratory rhythm generator. We seek to describe and manipulate functional connectivity dynamics along the respiratory cycle that may constrain the gain, the frequency, the re-setting or the pause of the rhythm generator. Dr. Fortin has extensive experience in the genetic manipulation of developing respiratory neuronal ensembles and in manipulation of neural activity in mouse embryos and neonates. Dr Emiliani has established an advanced 2-photon light-shaping and imaging optogenetic platform allowing simultaneous optical control of neuronal firing in defined neuronal sub-populations with millisecond temporal, and single-neuron spatial, resolutions. The postdoctoral associate is expected to bridge strengths from both labs and through reading and writing neural activities unveil regularities about permanent rhythm generation. This 24 month position is funded by a grant from the French National Research Agency. The candidate is expected to lead the project and will be co-mentored by Dr. Gilles Fortin and Dr. Valentina Emiliani.

Essential requirements

PhD or MD/PhD with a background in neuroscience or biophysics.

An excellent record of research and scholarly activity.

Extensive wet-laboratory experience in advanced neurophysiological techniques (Patch-clamp, Viral-mediated gene targeting in animal models, Optogenetics, Calcium imaging) and quantitative data analysis.

Be imaginative, open, dynamic, collegial, strongly self-driven and well organized.

Desirable requirements

Electrophysiology (Whole cell) recordings in vitro (slice, organotypic culture) is preferred.

In-depth knowledge of a programing language is strongly preferred.

Experience in working with mice as a model organism is strongly preferred.

Background in motor system neuroscience, microscopy, and/or rodent behavior is preferred.

How to apply

Applications should include:

(i) 2-page statement of interest, including motivation behind applying and specific explanation of how the applicant's skills fit the requirements of the position

(ii) CV

(iii) List of publications

(iv) Names, email addresses and contact numbers of at least two referees who would be willing to provide letters of recommendation

The position is immediately available, though the start date is negotiable. Net salary: 2600€/month. We will continue reviewing candidates until the position is filled. Short-listed applicants will be invited for an interview.

Relevant references from hosting labs

1.Bouvier J, Thoby-Brisson M, Renier N, Dubreuil V, Ericson J, Champagnat J, Pierani A, Chédotal A, Fortin G†. Hindbrain interneurons and axon guidance

signaling critical for breathing. **Nat Neurosci.** 2010.
2.Wu J, Capelli P, Bouvier J, Goulding M, Arber S, Fortin G†. A V0 core neuronal circuit for inspiration. **Nat Comm.** 2017.
3.Papagiakoumou E, Ronzitti E, Emiliani V†. Scanless two-photon excitation with temporal focusing. **Nat Methods.** 2020.
4.Xin Paul Wei XP, Collie M, Dempsey B, Fortin G, Yackle K. A novel reticular oscillator in the brainstem synchronizes neonatal crying with breathing. **bioRxiv** 2021.
5.Bowen Dempsey, Selvee Sungeelee, Phillip Bokiniec, Zoubida Chettouh, Séverine Diem, Sandra Autran, Evan R. Harrell, James F.A. Poulet, Carmen Birchmeier, Harry Carey, Auguste Genovesio, Simon McMullan, Christo Goridis, Gilles Fortin†, Jean-François Brunet†. A medullary centre for lapping in mice. **Nat Comm.** 2021.

Please send your application to Dr Gilles Fortin.