



Postdoc position

Electrophysiology and behavioral tests in mouse models of *SCN1A* neurodevelopmental disorders

The group of Massimo Mantegazza is looking for a postdoc for performing and developing experimental approaches in the framework of research projects on models of neurodevelopmental disorders and epilepsies related to *SCN1A* gene mutations.

Mutations of the *SCN1A* gene, encoding the main sodium channel of GABAergic neurons ($Na_v1.1$), have been implicated in severe neurodevelopmental disorders (Mantegazza et al., 2021, *Physiological Reviews*, 101(4):1633-1689; Mantegazza & Broccoli 2019 *Epilepsia* 60(S3):S25-S38). In particular, Dravet syndrome (DS), an epileptic encephalopathy characterized by drug-resistant seizures and cognitive/behavioral deficits, is caused by loss-of-function mutations in *SCN1A*/ $Na_v1.1$, which induce generalized disinhibition of neuronal networks. We have also identified other mechanisms involved in homeostatic responses and pathological changes in neural networks in mouse models that recapitulate the DS phenotype. The overall goals of the research projects are: 1) to better understand the pathological mechanisms in animal models, in particular homeostatic and pathological remodeling, 2) to develop treatments by directly targeting the initial genetic dysfunction (the loss of function of *SCN1A*/ $Na_v1.1$), as well as homeostatic and pathological remodeling.

You will perform:

- Chronic video-EEG recordings in mice and signal analysis;
- Behavioral tests on mice to quantify cognitive functions, motor skills and social interactions;
- Chronic pharmacological treatments (in particular intranasal application);
- Ex vivo and cell culture patch-clamp recordings;
- Statistical analysis and formatting of results;
- Follow-up of the literature and improvement/adaptation of techniques and analyses according to the obtained results.

We expect from you:

- PhD in neurobiology, neuroscience, biophysics, physiology or related disciplines;
- Extensive knowledge of neuroscience and electrophysiology;
- Experience in conducting animal experiments, in particular video/EEG recordings, ex vivo patch-clamp electrophysiological recordings and/or behavioral tests in mice;
- To master electrophysiological analyses and/or behavioral tests;
- Experience with mouse surgery;
- Ability to develop, plan and execute complex experiments, with good autonomy in project management.
- Ability to work in a team.

Environment. The group of Massimo Mantegazza (www.ipmc.cnrs.fr/?page=mantegazza&lang=uk) has an established expertise in the development and study of *SCN1A*/ $Na_v1.1$ models in vivo, ex vivo and in vitro, and all the tools and the techniques required by the project are routinely used. The group is funded by multiple European (Horizon Europe, EJPRD, Era-Net Neuron) and French (ANR, Foundation Lejeune, Foundation Rare diseases) grants. The Institute of Molecular and Cellular Pharmacology - IPMC - is a multi-thematic institute of the French National Center for Scientific Research (CNRS) (<https://www.cnrs.fr/>) and the University Côte d'Azur (UCA) (<https://univ-cotedazur.eu/>) located in the technology park of Sophia Antipolis (<https://www.sophia-antipolis.fr/en/>), in the Nice area (French Riviera). The IPMC has an international environment and hosts 20 research teams (220 persons), which benefit from state-of-the-art platforms in imaging, electrophysiology, integrative biology, functional genomics, molecular and cellular biology, cytometry, biomolecule analysis.

Application procedure. A cover letter (max 2 pages, addressing the essential criteria listed above) and a detailed CV (no space restriction, with a list of published peer-reviewed articles and two contacts for references) have to be submitted through the official CNRS web site: <https://bit.ly/3t3mvcq>.

The position is for a period of 2 years. The first appointment is for one year with the option for an extension for the remaining period. The salary will be commensurate with experience according to the CNRS guidelines. Evaluation of candidates will begin immediately and the starting date will be as soon as an appropriate candidate is selected.