Open postdoc position: Sensorimotor mechanisms of perceptual alterations in a mouse model of Parkinson's Disease.

Prof. Mackenzie Mathis & Prof. Olaf Blanke
École Polytechnique Fédérale de Lausanne (EPFL), Switzerland

Although Parkinson's disease (PD) is primarily a movement disorder caused by nigro-striatal degeneration and associated with the classical symptoms of resting tremor, rigidity, and bradykinesia, it is today recognized as a heterogeneous disorder affecting many other brain regions and networks. PD manifests in a large wide variety of non-motor symptoms that include psychiatric symptoms (such as hallucinations and psychosis) as well as cognitive symptoms (mild impairment to dementia). Hallucinations are very frequent in PD and occur in up to 60% of PD patients, increase in frequency and severity with disease progression. They are associated with major negative clinical outcome such as cognitive decline and higher mortality, likely reflecting a more severe and more rapidly advancing form of PD (Lenka et al., 2019).

One of the most frequent hallucinations in PD is a specific hallucination called presence hallucination. The Blanke Lab has developed a robotics-based approach in humans applying conflicting sensorimotor stimulation that has enabled the induction of robot-induced presence hallucinations under controlled conditions in the lab (https://pubmed.ncbi.nlm.nih.gov/25447995/). We recently used that method to characterize a subgroup of PD patients with enhanced sensitivity for conflicting sensorimotor stimulation and robot-induced PH based on the selective disruption of a premotor-temporal network, compatible with the proposal that this increased sensitivity predicts a more severe and more rapidly advancing form of PD in affected individuals (https://www.biorxiv.org/content/10.1101/2020.05.11.054619v1).

The present project plans to utilize mouse models of Parkinson's to develop new behavioral assays that can test for sensorimotor hallucinations (and other cognitive and sensorimotor deficits). This work will utilize cutting-edge machine vision, robotics, neural recordings (neuropixel, large scale imaging) and novel behavioral paradigms available at the Mathis Lab.

The successful candidate will work in the Mathis Lab at Campus Biotech (http://www.mackenziemathislab.org) and will be co-supervised jointly by Mackenzie Mathis and Olaf Blanke (https://www.epfl.ch/labs/lnco/). The ideal candidate should have a PhD in neuroscience, engineering, or computer science and have strong training in systems neuroscience (a background in building rigs, electrophysiology, data analysis, Python and animal behavior). They should also have a strong publication record, be collaborative, an excellent communicator, and be passionate about human and animal neuroscience for translational applications. Applications and inquiries should be sent here: **https://forms.gle/nAK86nsLhJFRtGv5A**. This will ask you for a CV, publication list, a letter of motivation, and a 3-minute video stating motivations and qualifications.