ETH zürich institute of neuroinformatics University of Zurich[UZH]

PhD in Neurotechnology, ETH Zurich

Focused-ultrasound mediated, non-invasive drug delivery to the brain.

Background

The ETH Zurich Neurotechnology group (Prof. Mehmet Fatih Yanik) at the Institute of Neuroinformatics is looking for an outstanding PhD student with training in the fields of **biomedical engineering, neuroscience, biochemistry** related fields. The goal of the project is to use a novel technique recently developed in the Neurotechnology group that utilizes Focused Ultrasound (FUS) for non-invasive, precise drug delivery (see Ozdas, Shah, Johnson et al. 2020, *Nature Communications*) to explore new routes of treating brain disorders and brain diseases.

Project

The student will advance and use Focused-Ultrasound mediated drug delivery to treat different pathological brain conditions in animal models. Initially, the focus will be on rodent models of treatment-resistant brain tumors and also on neuropsychiatric disorders. The later phase of the project can involve primate work.

The project will involve:

- Chemistry / fabrication of micro-bubbles and loading of drugs into liposomes
- Optimizing the Focused Ultrasound hardware and sequence for targeting specific brain areas
- Behavioral and neurophysiological characterization of cognitive abilities and potential side effects in the animal models
- fMRI-guided targeting, drug delivery and dosing
- Histological analysis of tissue.

Education & requirements

Applicants should have a Bachelor's and ideally also Master's degree in the fields mentioned above or related studies. Essential requirements are experimental/bench experience (e.g., in-vivo experiments, chemistry), good quantitative and analytical skills, solid knowledge of at least one programming language (such as Python or Matlab) and excellent grades. A strong interest in fundamental neuroscience is expected as well as the willingness to perform animal experiments.

Start date & duration

The start date is spring 2021. Applications are accepted until the positions are filled. The position is for 4-6 years. The candidate will be enrolled as PhD student at the ETH Department of Information Technology and Electrical Engineering, and the Neuroscience Center Zurich (ZNZ) PhD program.

Contact

Applicants should send, in one merged PDF, a cover letter with a statement of research interests, CV, publications, relevant certificates (degrees and grades), and the name and contact of at least two references to **ntjobs@ini.uzh.ch**

More information about the group and institute

The Neurotechnology group is developing advanced technologies to image, to communicate with, and to manipulate brain circuits and cognitive behavior. For this purpose, we employ technologies ranging from optics/ optoelectronics, electrophysiology, fMRI, brain machine interfaces, and non-invasive nanoparticle /neuromodulator delivery methods (http://www.neurotechnology.ethz.ch/). The mission of the Institute of Neuroinformatics (University & ETH Zurich) is to discover the key principles by which brains work and to implement these in artificial systems that interact intelligently with the real world (https://www.ini.uzh.ch/en.html).

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