

PhD Thesis in microfluidic cryo-EM sample preparation for neurodegeneration studies

The EPFL ranks among the world's top scientific universities. We are located in Lausanne in Switzerland, a beautiful, vibrant and highly international city on the shores of scenic Lake Geneva, situated within an Alpine setting in the heart of Europe. French is the main language spoken in the city of Lausanne, and English is the main language at the EPFL and in our laboratory. The position comes with a competitive salary. EPFL is committed to being an equal opportunity employer.

The successful candidate will join a vibrant, collaborative, international, and diverse research team with interdisciplinary expertise in biology, physics, computer science and engineering. The focus of research activity at the LBEM is centered around neurodegeneration and method development in cryo-electron microscopy (cryo-EM). The LBEM is a newly established research lab at the Institute of Physics at the EPFL, we enjoy unique state-of-the-art instrumentation. We also have access to several other instruments such as further 300kV Titan Krios with Cold-FEG, SelectrisX and FalconIV detectors at the Dubochet Center for Imaging (DCI Lausanne).

Your mission:

The candidate will work with, optimize and further develop the CryoWriter, so that biological samples for neurodegeneration can be extracted from human brain tissue slices and spread on a cryo-EM grid, which is then studied by cryo-EM and image processing. The CryoWriter is a modular system that can be extended by additional elements to become a fully-fledged biochemistry laboratory, all contained within the microfluidic robotic environment.

For more information on this topic, please see:

<https://www.lbem.ch/research/equipment/cryowriter/>

During this PhD, you will work with microfluidic principles and high-precision robotics to prepare cryo-EM specimens. The CryoWriter will be adapted towards neurodegeneration studies, which we will approach in close collaboration with the CryoWriter-AG team.

This PhD thesis involves the handling complex hardware and remote computer control. Involved disciplines are microfluidics, robotics, electronics, automation, and 3D printing, as well as cryo-EM sample preparation, cryo-EM structure analysis and application to neurodegeneration topics.

Your profile:

Candidates should feel comfortable to work with and modify complex robotic instrumentation. Experience in electron microscopy is welcome, but can also be learned in the lab. A background of physics, electrical engineering, materials sciences, life sciences or related disciplines is a good starting base. The project will involve high-resolution cryo-EM data collection and developing methods to control and optimize the microfluidic sample preparation.

Good proficiency in English is required.

How to apply:

Please send your application with PDF documents including a Cover letter, a CV and the contact information of 3 references to henning.stahlberg@epfl.ch.

For the PhD fellowship:

The student will need to enroll in the Physics program of the EPFL doctoral school. The employment extends to a total of 4 years, assuming a successful evaluation after the first year of PhD. Applicants are expected to hold a Master degree in physics by the start of employment.

Start date:

The position is available immediately, the starting date is flexible.

Contact:

For questions or additional information, please contact Prof. Henning Stahlberg at henning.stahlberg@epfl.ch.