

Internship Proposal

Creating a microfluidic system to study metabolomic profile in soma and axons of neurons

Duration: 5-6 months starting January or February 2027

Keywords: Microfluidics ; Organ-on-chip ; Neurosciences ; ALS ; Stem cells (iPSC) ; Microfabrication ; Imaging ; Interdisciplinarity

Locations:

This internship is part of a NeuroStra project involving:

- PCBIS drug discovery platform, Illkirch – [Microfluidic department](#)
- CRBS (Strasbourg Biomedical Research Center), Strasbourg – [SLA-DFT Team](#)

Supervisors: Céline Braïni (PCBIS), Wenting Guo and Valérie Jolivel (CRBS)

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Context:

Amyotrophic Lateral Sclerosis (ALS) is a neurodegenerative disease characterized by progressive motor neuron degeneration. Increasing evidence suggests that axonal dysfunction and metabolic alterations occur early during disease progression. Microfluidic systems allow compartmentalization of neuronal soma and axons and represent powerful tools to study neuronal biology *in vitro*. However, currently available commercial devices are not optimized for large-scale metabolomic analyses. This interdisciplinary project combines expertise in neuroscience, human iPSC-derived neuronal culture and microfluidic engineering to develop innovative microfluidic chips that can be dedicated to the separate analysis of soma and axons.

Objectives and missions:

The student will participate in the development and optimization of microfluidic chips for neuronal culture and compartmentalization, allowing sufficient collection of material for metabolomics/proteomics analyses.

Main tasks: CAD of microfluidic devices; SU-8 mold fabrication at the [STnano Facility](#); PDMS chip production and characterization; testing different chip geometries and fabrication parameters; neuronal culture (human motor neurons and/or cortical neurons) in chips; characterization of neuronal growth; fluorescence microscopy skills and image analysis.

Candidate profile:

We are looking for a motivated Master 2 or engineering student with interest in microfluidics, bioengineering, biophysics and neuroscience.

Appreciated skills: experimental rigor and autonomy; interest in interdisciplinary research; basic knowledge in microfabrication, CAD, microscopy or cell culture is a plus.

Application: To apply for this internship, please send your application by email (see contacts above), including a CV and a motivation letter.