

6 months internship – Development of a model of the peripheral nervous system for nanobiotherapeutics screening

Keywords: *organ-on-chip, high content screening, peripheral nervous system, biotherapeutics*

Context of the MOCHI project: New alternative models of the nervous system are becoming a key enabler for the study of neurodegenerative disease and the screening of emerging nanotherapeutics. Among the priority in their characterization, quantifying their safety and gene transfection in the peripheral nervous system (PNS) remain central. The group has recently developed a miniaturized peripheral nervous system model on a chip (MOCHI) that exhibits sensory neuron networks for myelin study.[1] The group now aims to diversify the applications of the model in order to broaden the range of phenotypes and increase the throughput for screening the toxicity and the potency of nanoscale biotherapeutics in the PNS.

Mission: To develop a model of the peripheral nervous system on a chip for nanobiotherapeutics screening applications. The candidate will develop the design, fabrication and biological characterization of this model. Depending on the project's progress, the intern may explore screening aspects on a panel of available nanobiotherapeutics and cellular models.

Candidate profile: A master or engineering school student specializing in microfluidics, biomechanical or biomedical engineering, with a prior experience in cell culture. Experience in microfluidics, microscopy and/or microfabrication will be a major asset.

The candidate should have a strong interest in interdisciplinary research and technological development, and being able to work as part of a collaborative project involving industrial and academics partners.

Environment:

This project is a collaboration between 3 labs of Université Paris Cité: (i) [HEALTHFEX](#) (UMR-S 1124), an INSERM biology and toxicology laboratory dedicated to the toxicological study of systems such as myelin and the peripheral nervous system, (ii) [NABI](#) (UMR 8175), an INSERM and CNRS unit related to study of biotherapeutics at the nanoscale and extracellular vesicles physicochemical characterization, (iii) [UTCBS](#) (UMR 8258) for nanomedicine translation and biological characterization and iv) a French BioTech company: [NEOVACS](#) for the access to lipid nanoparticles biotherapeutics panel and development of potency tests. The intern will be based primarily at the Campus St Germain in HEALTHFEX unit. Our project has privileged access to technological platforms (microfabrication, microscopy, IVETh platform dedicated for nanoparticle therapeutics characterization), cell biology facilities and panel of samples.

Starting date: February 2027

Thesis opportunity: to be discussed

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Bibliography:

- [1] Moreau, S. et al.: Reversible and reusable compartmentalized thermoplastic chip for coculture of dorsal root ganglion neurons. *Lab Chip*, **25** (24), 2025, p. 6741–6755.