Interdisciplinary Institute for Neuroscience
Université de Bordeaux, CNRS – UMR 5297

Looking for an engineer position to develop automated fluidics and microfabrication approaches for multi-conditions observation of 3D biological samples using the soSPIM technology

Project description

Spheroids and organoids have emerged in the last decade as very promising biological models for applications ranging from fundamental research to toxicology assays or drugs screening. However, the difficulties to culture and image them in 3D hamper their full adoption by laboratories and compagnies. In the meantime, Light Sheet Fluorescence Microscopy technics (LSFM) have proven to be extremely efficient for 3D imaging of biological samples at various spatial and temporal scales with minimal photo-damaging effects. However, LSFM technics are usually restricted in the number of sample and/or condition that can be probed due to complex sample mounting constraints. To address those questions, we develop in collaboration with V. Viasnoff and G. Grenci teams at MBI (NUS, Singapore) a culture and imaging platform combining microfabricated micro-wells, with a single-objective-based LSFM architecture named soSPIM [1]. This combination allows to standardize and parallelize both the culture and the imaging of complex 3D biological models, paving the way toward the use of spheroids and organoids in multi-conditions screening experiments [2].

In that perspective, we aim to develop new culture vessels that would allow to transform our culture and imaging platform in a multi-condition one. Those new vessels will have to allow the appropriate and timely delivery of media and chemical compounds into the 3D cultured models. Then, a dedicated process will be implemented to allow the automated monitoring of those different conditions using the soSPIM 3D imaging technology.

Missions:

The candidate missions will be: i) to develop a custom fluidics system for media and chemical compounds delivery into multi-wells plates, and ii) adapt the fabrication process of the JeWell devices to this multi-well plate format. She/he will also participate to the validation of the multi-conditions systems created performing toxicology assays on 3D biological models developed in the team or by collaborators.

Candidate profile:

We seek a motivated, enthusiastic and independent candidate, with a strong expertise in fluidics and automation and showing an interest in biology. Complementary skills in fluorescence microscopy, and/or programming would be appreciated. The candidate will work in an English-speaking environment, in close interactions with biologist in Oncology (**BRIC**).

Environment:

The candidate will be hosted in the **Quantitative Imaging of the Cell** team, a R&D team with an internationally-recognized expertise in live cell microscopy and quantitative analysis. This project is financed on the ANR project Deep-Hepatoscreen, in collaboration with Frederic Saltel (**BRIC**) and Macha Nikolski teams (**CB&B**). The contract is for two years from September 2023.

Contract:

Applicants should send a CV, a motivation letter and contact details for at least two referees to: jean-baptiste.sibarita@u-bordeaux.fr and remi.galland@u-bordeaux.fr;

References:

1 Galland, R. *et al.* 3D high- and super-resolution imaging using single-objective SPIM. *Nat Methods* **12**, 641-644 (2015). https://doi.org:10.1038/nmeth.3402

2 Beghin, A. *et al.* Automated high-speed 3D imaging of organoid cultures with multi-scale phenotypic quantification. *Nat Methods* (2022). https://doi.org:10.1038/s41592-022-01508-0

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