

ONLINE MONITORING OF 3D BIOPRINTED TISSUE CULTIVATION

The project aims at **developing new tools for the monitoring in real-time of 3D bioprinted tissue cultivated in bioreactors**. The methodology will focus **on the development of two complementary technologies, the Raman Spectroscopy and the Online Rheology**. Both were already deployed in the lab for preliminary assays. **This project aims at realizing the proof of concept for their use for tissue structure monitoring** (extracellular matrix composition and mechanical properties, presence of cells). The student will be in contact with several industrials as part of the project is a collaborative program with Sartorius Stedim and Kaiser Endress companies.

Project duration 6 months – February to July 2022

CONTEXT

3d.FAB platform hosting the project, is an innovative technological platform of Lyon university specialized on development and use of additive manufacturing technology for healthcare (<http://fabric-advanced-biology.univ-lyon1.fr/>). 3d.FAB platform is the only French “Plateforme Technologique Innovante” dedicated to academic and private innovations through 3D, 4D and bioprinting, in the field of life science and healthcare. 3d.FAB currently owns 170 m² of laboratory, including 80 m² of P2 laboratories to welcome the bioprinting, bioprocesses and regenerative medicine activities. The platform has expertise and facilities in the following areas:

- Biochemistry, especially diagnosis with prototyping 3D lab-on-chip, novel materials for 3D medical devices, biocompatible polymers and cell-size 3D printing.
- Regenerative medicine through dedicated living cells and tissues printers.
- Additive manufacturing with more than 10 additive manufacturing technologies combined.
- Simulation to create optimal liquid flow inside the 3D printed tissues.
- Bioprocess for connective tissue maturation and vascularization.
- Level 2 biofabrication laboratories equipped with state-of-the-art bioprinters and bioreactors.

MISSIONS

Scientific missions

- Evaluation of the in-house developed online rheometer analysis for the monitoring of tissue extracellular matrix composition
- Evaluation of contact Raman spectroscopy with Kaiser PhAT probe

EXPECTED KNOW-HOW

Master degree in Analytics (Analytical chemistry / biotechnology) – Knowledge in chemometric analysis – Raman spectroscopy – Additional appreciated expertise: Experience in the Biotechnology / Bioprocess field

APPLICATION

Application to be sent at emma.petiot@univ-lyon1.fr & edwin.courtial@univ-lyon1.fr: CV + Motivation letter