

## POST DOCTORAL POSITION

### Bone tissue engineering

INSERM / UPS, UMR 1214, ToNIC, Team 3D CHIP

#### WORKPLACE

Inserm, CHU Purpan, Toulouse, France

#### PROJECT TITLE

Biofabrication of a 3D human bone tissue for modelling fracture healing *in vitro*

#### FUNDING

This project is part of ORTHO-ALLO-UNION (10 m€, 2024-2028) and is funded by the Horizon Europe program. Under this project, a clinical trial will be conducted to treat non-union bone fractures on 80 patients with a combined cryopreserved advanced therapy medicinal product (ATMP) consisting of allogeneic mesenchymal stem cells and biomaterials.

#### DESCRIPTION

The objective is to develop a 3D bone model to screen different donors and biomaterials in the context of non-union fractures. Preliminary research has demonstrated the feasibility of forming 3D living osteoid constructs from human bone marrow derived mesenchymal stem cells, peripheral blood monocytes and calcium phosphate biomaterial granules (Gamblin AL and coll., Acta Biomaterialia 2014). This miniaturised 3D model will be further enriched with hematopoietic stem cells and endothelial cells within a microfluidic chip to form a mature bone organ *in vitro*. This bone organ on chip model will be used to assess different donors and biomaterials for their ability to support osteogenesis and to study bone healing as an alternative to animal experimentation following the 3R directive.

#### RESEARCH ENVIRONMENT

The emerging team 3D CHIP '3D bioprinting of human tissues and organoids on chip' directed by Prof. Pierre Layrolle is anchored within the hospital-university campus of CHU Purpan in Toulouse. The team has installed a biofabrication lab, fully equipped for cell culture, microscopes, 3D bioprinters, microfluidic devices and benefits from the local Inserm platforms for flow cytometry, histology, confocal, bi-photon, light sheet microscopy.

#### CANDIDATE PROFILE

The post-doctoral candidate should have training and experience in the fields of cell biology and bioengineering, particularly in the area of bone tissue engineering, acquired during his/her PhD and preferably followed by 1-3 years post-doctoral contract. The candidate should possess practical experience in 3D culture of stem cells with biomaterials and a proficient knowledge of the methods of characterization of the 3D constructs such as electronic and

photonics imaging methods, computerised tomography, flow cytometry, RTqPCR, histology and immunohistochemistry. A previous experience of microfluidic organ on chip devices will be greatly appreciated but not mandatory. He/She should demonstrate autonomy, initiative taking abilities, and the capacity to integrate and collaborate within a research team composed of researchers, clinicians, engineer, Master and PhD students. Proficiency in English and aspiration to learn French will be desired.

### **POST DOCTORAL POSITION**

We offer a post-doctoral contract of 3 years with a monthly gross salary of 2909 € to 3303 € depending on experience.

### **APPLICATION**

- CV with background, summary of previous research work, contact details of supervisors, list of publications and communications
- Letter of motivation
- Letter of recommendation (if available)

### **CONTACT**

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