





Post-Doc Position

 CDD 18 months

 Start : early/2024

 Montrouge/Paris

The Laboratory: URP2496 - BRIO "Orofacial Pathologies, Imaging and Biotherapies" directed by Catherine Chaussain at the Dental School, Paris Cité University - 1 rue Maurice Arnoux - 92120 Montrouge – France

General presentation: The BRIO unit's is interested in the mechanisms underlying chronic oral pathologies and rare disorders, which affect both the skeleton and the tooth mineralization. The team develops new therapies to repair the oro-facial defects resulting from these chronic and rare pathologies, including tissue engineering strategies or new medical devices. BRIO's main objective aims at studying the mechanisms underlying chronic diseases or rare disorders affecting the oro-facial tissues and explores the outcomes of new treatments for these disorders such as gene therapy, biotherapies and tissue engineering. The BRIO research expertise combines in vitro (3D cultures, co-cultures, bone and tooth organoids...) and preclinical (mouse, rat and porcine models) approaches as well as clinical research on cohorts of patients with rare or chronic disorders.

Background and position: The scientific background of this project relies on neurovascular coupling on bone regeneration. Lack of innervation is associated with a reduction of tissue regeneration capacity and graft/implant integration. The presence of a developed invading and colonizing neurovascular network would have significant downstream effects on the success of the whole implant integration. Vascularization has long been acknowledged as one of the most pressing challenges in tissue engineering, as it is essential for the survival of larger tissues giving access to nutrients and oxygen exchange. However, implanted engineered constructs also lack preformed neural networks and depend on host bed-induced innervation to integrate with the native nerve supply. Not sufficient attention has been given to promoting targeted and appropriate connections between the host neurovascular networks and engineered implants. In this context, Bruno PAIVA has been studying the bone regeneration process and has developed an expertise on the communication between sensory nervous tissue, bone and vascular tissues. In 2023, he obtained an ANR funding to pursue this multidisciplinary project with the involvement of a post-doc fellow.

This position aims to study the role of innervation and vascularization on bone reconstruction by (i) developing a 3D in vitro model to study the cellular communication between nervous, vascular and bone tissues, and (ii) evaluating in vivo a strategy for implant integration and bone formation.

- We are looking for a highly motivated candidate with strong motivation to carry out the basic research as well as the experimental study with the use of cellular culture and mice models. A solid background in molecular and cell biology will be the best suited for this project. The candidate will strongly interact with Nathalie Lefort and Céline Banal from the IPS Platform at the Imagine Institute in Paris.



Activities:

• Culture and differentiation of inducible pluripotent cells into neural crest-derived cell phenotypes

- Culture and characterization of 3D cell cultures
- Perform fluorescence microscopy and 3D image analyses
- Produce and characterize cell culture in microfluidic devices
- Perform histological techniques and analyse histological slides
- Assist the coordinator in project management tasks
- Disseminate and showcase results in the form of reports and presentations
- Update knowledge through literature research
- Coordinate human resources, plan device usage, manage operational budgets

SPECIAL CONSTRAINTS:

- Foster self-development, train others, and share knowledge
- Take initiatives, be organized, rigorous, autonomous, and capable of assuming responsibilities
- Strong interpersonal skills; ability to work in a team and network

CAPABILITIES:

Knowledge

- Statistics
- 2D and 3D cell culture and cell characterization
- Histology
- General knowledge of quality management rules and methods
- Basic knowledge of financial and accounting management rules

Skills

- Experience in image analysis is a plus
- Experience in tissue engineering is a plus
- Experience using organ-on-chip tools is a plus
- Proficiency in reading, speaking, and writing English

Abilities

- Ability to take initiatives, be organized, rigorous, autonomous, capable of assuming responsibilities, and managing personnel
- Strong interpersonal skills, ability to work in a team, network, and communicate
- Willingness to learn, teach, and develop new protocols
- Apply and enforce hygiene and safety rules in the field

Application procedure:

Contact Bruno PAIVA (bruno.paiva@u-paris.fr) sending your CV and motivation letter and contact of at two reference scientists