Postdoctoral Position in Corneal Regeneration

Using Bioengineered Epitheliostromal Substitutes for Surgical Applications

COBRAS : COrneal BioimpRession for Advanced Surgical reparation

Contract Type - Duration: Fixed-term contract (CDD) – 24-36 months **Desired Start Date**: January 2025
Employer : Assistance Publique des Hôpitaux de Marseille - AP-HM
Location : Hôpital de la Conception, Laboratoire de Culture et de Thérapie Cellulaire (LCTC), France

CONTEXT :
As part of a research and development program in corneal tissue engineering, we are looking for a highly motivated, rigorous, and talented individual. This program is part of a multidisciplinary translational research initiative focused on regenerative medicine and cell therapy, using advanced technologies such as 3D bio-printing and tissue cryopreservation. The goal is to revolutionize the management of corneal disorders leading to blindness by reducing treatment times, production costs, and increasing the availability of grafts. In parallel to their clinical application, these allogeneic corneal substitutes could serve as *in vitro* models for experimental pharmacological and toxicological studies.

The project's objective is to develop an innovative allogeneic tissue engineering product, consisting of a 3D bio-printed epithelial-stromal corneal substitute, compliant with pharmaceutical requirements. This corneal tissue assembly is designed to prevent major complications of pathologies (such as ulcerations, fibrosis, or inflammation) in the context of graft shortages.

The project is supported by a consortium of French teams, funded under the Research and Equipment Priorities Program (PEPR) "Biotherapies and Bioproduction of Innovative Therapies" (BBTI) from June 2025 to June 2029.

TECHNICAL ACTIVITIES :

1- Assembly and formulation of an epithelial-stromal corneal substitute
- Development of amplification strategies and assembly within a matrix of corneal epithelial and stromal stem cells
- Evaluation of various formulations combining matrix and cells
- Optimization of culture and cell differenciation conditions
- Monitoring biological characteristics throughout the manufacturing process

2- Optimization and validation of 3D bio-printing manufacturing processes
- Development and optimisation of bioprinting programs.
- Validation of 3D bio-printing protocols.
- Production of validation batches of allogeneic tissue substitute.
- Implementation of quality control methods (identity, viability and functional integrity)

3- Stability study
- Monitoring of biological characteristics over time

4-Validation of cryopreservation
- Development and validation of protocols
- Monitoring of biological characteristics of thawed epithelial-stromal substitutes.

QUALITIES AND SKILLS
This position plays a central role in coordinating this multidisciplinary project, based on close collaboration between clinicians, researchers, engineers, and the industrial manufacturer of the 3D bio-printer. The candidate, enthusiastic and highly motivated, must hold a PhD or engineering degree and have advanced expertise in cell culture and tissue engineering, enabling the development of complex tissue models integrating innovative bio-fabrication technologies. Experience in bio-printing, handling biomaterials, and cryopreservation would be an asset. We are looking for a candidate who is autonomous, responsible, and rigorous, willing to commit to a hospital structure in this ambitious project. The candidate should also demonstrate a strong interest in process development and technological innovation. Proficiency in communication tools is essential for active project management.

ENVIRONMENT AND CONTEXT
- Public hospital laboratory : R& D sector
- Aseptic environment / clean rooms
- Cryoconservation area
- Occasional travel between Marseilles and Paris.

Application : Interested candidates are invited to send their CV to julie.veran@ap-hm.fr;chloe.dumoulin@ap-hm.fr; along with a cover letter, any letters of recommendation, and references for recent publications.