

Postdoc with the possibility of opening an INSERM Junior Professor position

Scientific background and objectives:

INSERM UMR-S999 unit, led by Professor Marc Humbert, is dedicated to studying the pathophysiology and therapeutic innovation of pulmonary hypertension. (<http://www.u999.universite-paris-saclay.fr/fr/>).

The recruited scientist will join the 'Biomedical Engineering' Research Group led by Professor Olaf Mercier (PUPH Thoracic Surgeon, Université Paris-Saclay, Marie Lannelongue Hospital), within Team 2 of Inserm UMR-S999 supervised by Dr. Fabrice Antigny (INSERM) and Professor David Montani (PUPH Pulmonologist, Université Paris-Saclay).

He/She will implement a research theme focused on developing non-pharmacological therapeutic innovations for treating respiratory insufficiencies, particularly targeting pulmonary hypertension. To accomplish this, the candidate will closely collaborate with the surgical team at Marie Lannelongue Hospital.

The research program is divided into two aspects:

Part 1: The artificial lung

This part relies on initial work conducted within an RHU program (Bioartlung – 15RHUS0002), which resulted in the creation of a miniature right ventricular cardiac support system. This system is currently being supported by SATT Paris-Saclay in a “maturation” program. However, there are still several challenges to overcome in order to make this technology less intrusive and notably more resilient, aiming for long-term replacement of diseased lungs.

Exploring the interaction between biomaterials and blood components, as well as understanding inflammation and coagulation, is necessary to discover physical, biological, or therapeutic approaches that can reduce thrombosis, inflammation, and infections. Besides engaging with surgeons, a robust collaboration with engineers will be facilitated by the existing structure of the research unit, which has cultivated strong ties with Paris-Saclay plateau schools since 2015.

Part 2: Development of ex vivo pulmonary perfusion as a biotherapy platform

The research group led by Professor Olaf Mercier has developed expertise in the use in the operating room and in the search for ex vivo pulmonary perfusion as a means of lung preservation. The challenge is to be able to create a long-term lung perfusion platform in order to be able to treat these lungs with innovative biotherapies, to repair them (trauma treatment, infections, etc.) or to increase their resistance to viral infections, limitation of rejections, etc.. This platform would provide hope for an increase in the number of lung transplants and their longevity. From a therapeutic point of view, this platform will allow the development of restorative therapeutics for the different forms of pulmonary hypertension, allowing the retransplantation of the repaired lungs of patients waiting under artificial lungs. The challenges to be targeted are the development of biological monitoring of the lung outside the body, the establishment of the protocol of maintenance in physiology, and the development of effective therapeutics.

Scientific environment:

The candidate will carry out his research work within team 2 of the UMR-S999 on the dedicated platform in the Marie Lannelongue Hospital located adjacent to the scientific valley of the Bièvre and the plateau of Saclay. The research building includes a molecular biology platform, cell culture rooms, and animal care facilities with access to a surgical platform

similar to the human operating room located in the main building. The research building will undergo a facelift in 2026 with the construction of the new hospital, which will be located 800 m from the current one, closest to public transport. The research platforms will be reproduced identically with the possibility of having complementary surfaces for the development of the activity of the group «Technology for Health». The UMR-S999 unit is composed of two sites with a site at the Kremlin Bicêtre and a site at the Marie Lannelongue Hospital, involving strong collaboration between the two research teams in the image of the medical interaction between the two centers. Joint scientific meetings and events are regularly organized.

Qualifications:

The candidate should have a PhD and ideally a post-doctoral experience in cardio-respiratory physiology or bioengineering/biotherapy. Autonomy and a motivated spirit showing initiative are encouraged. The job requires skills in cardiopulmonary physiology, cell culture, imaging, cell regeneration, and gene and cell therapy. The English language must be written and spoken.

Provision of the position:

The position is open for application immediately for a start as soon as possible.

It should be noted that the projects described have received funding that will be made available to the candidate upon recruitment.

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