PhD fellowship at the interface between Cancerology / Immunology / Vascular biology

A PhD student position funded for 3 years by the **LABEX TOUCAN** ('Laboratoire d'Excellence Toulouse Cancer'; https://www.crct-inserm.fr/labex-toucan/) is available in the Teams of **Jean-Philippe GIRARD** (IPBS, CNRS and University of Toulouse, France ; http://www.ipbs.fr/vascular-biology-endothelial-cells-immunity-inflammation-and-cancer) and **Camille LAURENT** (CRCT, Inserm and University of Toulouse; https://www.crct-inserm.fr/09-j-j-fournie/)

Project Title: SINGLE CELL MAPPING OF THE VASCULATURE IN AGGRESSIVE B LYMPHOMAS AND TOPOLOGICAL INTERACTIONS WITH CD8 T CELLS AND γδ T CELLS

Keywords: aggressive B lymphoma, high endothelial venule, endothelial cell, spatial transcriptomics, scRNA-seq, anti-tumor immunity)

Abstract: Immunity plays an important role in cancer control, notably with highly mutated tumours such as Diffuse Large B-cell Lymphoma (DLBCL), an aggressive (fast-growing) non-Hodgkin lymphoma that affects B cells. Indeed, CD8 T cells and γδ T cells display potent antitumour cytotoxicity and are specifically reactive to lymphomas. DLBCL often develops in the lymph nodes. High endothelial venules (HEVs) are specialized blood vessels for lymphocyte entry into lymph nodes. HEVs may thus play an important role in the recruitment of CD8 T cells and γδ T lymphocytes in DLBCL lymph nodes.

The major objective of the project is to perform single cell mapping and spatial transcriptomics (ST) to characterize the density, maturation and functional status of HEV endothelial cells (MECA-79$^+$CD31$^+$) and non-HEV endothelial cells (MECA-79$^-$CD31$^+$), and define their topological interactions with cytotoxic γδ T cells and CD8 T cells in DLBCL patient's biopsies. The project will greatly benefit from the expertise of:

- Jean-Philippe Girard's team (IPBS) on HEV blood vessels, scRNASeq analyses of endothelial cells, and HEV-mediated lymphocyte recruitment in lymph nodes (Moussion and Girard, Nature 2011; Girard et al., Nat Rev Immunol 2012; Lafouresse et al., Blood 2015; Veerman et al., Cell Rep 2019), and
- Camille Laurent's team (CRCT) on human B cell lymphomas (Laurent et al., Blood. 2020; Laurent et al., J Clin Oncol. 2017; Laurent et al., Blood. 2011), cytotoxic T cells, single cell RNA sequencing (scRNASeq, CITEseq) (Pizzolato et al., PNAS 2019; Pont et al., Nucleic Acids Res 2019) and spatial transcriptomics (transcriptomic hallmarks of all cells in a lymphoma biopsy *in situ*).

This study will deeply increase our knowledge about the distribution and functional status of HEV and non-HEV endothelial cells, γδ and other cytolytic T cells infiltrating human lymphomas. It may have important clinical consequences such as the identification of new predictive biomarkers, and guide T cell-based immunotherapies currently developed in Comprehensive Cancer Centers worldwide.

Requirement: Master in Cancerology, Immunology, Vascular Biology or Molecular Biology. Experience in scRNA-seq and/or bioinformatics will be a plus. We are looking for a creative and highly motivated PhD student strongly committed to research. Joint PhD supervisors: Drs Jean-Philippe Girard (IPBS) and Camille Laurent (CRCT).

Contract: 3 years full time PhD student position funded by LABEX TOUCAN (starting date: October 1st, 2021). The salary is in accordance with the French Ministry for Higher Education and Research salary scale. Social security and health benefits are included. Work context: research conducted at both IPBS and CRCT, two large Research Centers from CNRS, Inserm and University of Toulouse. All the necessary biological resources and research facilities, including state of the art technological facilities, will be available.

How to apply: Please, send your application (in French or English, including a motivation letter, curriculum vitae, and rankings in University Licence/Master or Engineering school) to jean-philippe.girard@ipbs.fr and laurent.c@chu-toulouse.fr (Deadline: the position will remain open until filled; only successful applicant will be contacted).

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