Internship proposition
One page max
M2 0HNU 2025-26

Lab: Sébastien Carreno - IRIC - Université de Montréal

Team: https://www.iric.ca/en/research/research-units/cellular-mechanisms-of-morphogenesis-during-mitosis-and-cell-mobility

Name and position of the supervisor: Sébastien Carreno – Full professor

Email of the supervisor: sebastien.carreno@umontreal.ca

Candidate:

Title of the internship: **Role of the PTEN-PLCXD1 Pathway in Autophagy Regulation and Cancer Cell Survival**

Summary of the internship proposal: Autophagy is crucial for cellular homeostasis and survival during stress. However, its role in cancer is complex. It can act as a tumor suppressor or support tumor cell survival depending on the cancer stage. Phosphoinositides (PIs), especially $PI(4,5)P_2$, play essential roles in regulating autophagy initiation and progression. Our lab recently discovered a novel signaling pathway involving the tumor suppressor PTEN, which activates an atypical phospholipase C called PLCXD1. This pathway specifically reduces $PI(4,5)P_2$ levels on lysosomes. Our preliminary data indicate that the PTEN-PLCXD1 pathway is evolutionarily conserved and critical for regulating autophagy and enhancing cancer cell survival, particularly under hypoxic conditions. This MSc rotation project will focus on characterizing the role of PLCXD1 in autophagy regulation and determining its impact on cancer cell survival. Using human cell lines, we will analyze the localization of PLCXD1 and its effects on PI(4,5)P2 dynamics and autophagic flux through fluorescence microscopy techniques. Additionally, we will evaluate the role of PLCXD1 in the survival of renal cancer cells under hypoxic stress using viability assays. This work will help clarify how PLCXD1-mediated PI(4,5)P2 modulation influences autophagy and cancer cell survival, highlighting its potential as a therapeutic target.

Option(s) linked to the project:

☐ Hematology
☐ Immunology-Cancerology
x Oncology
☐ Nuclear Medicine

Option(s) linked to the profile:

☐ Clinical Research Profile
x Experimental Biology Profile
☐ Data Analyst Profile