

**Internship Proposition**  
**(one page max)**  
**Master 2 GP Immunology & ImmunIntervention (I<sup>3</sup>)**  
**2024-2025**



**Lab: Frédéric A. Mallette (Université de Montréal / Hôpital Maisonneuve-Rosemont)**

**Team: Chromatin structure and cellular senescence Research Unit**

**Name and position of the supervisor: Frédéric A. Mallette**

**Email of the supervisor: fa.mallette@umontreal.ca**

**Candidate (if internship filled):**

**Title of the internship: Investigation of the role of cholesterol metabolism in cellular senescence and inflammation**

**Summary of the internship proposal:**

Deficient blood supply to the central nervous system (CNS) leads to several debilitating diseases. Examples of such diseases include stroke which is a leading cause of brain injury affecting 800,000 individuals per year in the United States alone and causing upwards of 150,000 deaths. To study the molecular mechanisms of stroke, an easily accessible model system in which to investigate how blood vessels interact with nerve cells is the retina, the membrane of nerve cells at the back of the eye that relays visual information to the brain. The retina is biochemically analogous to the brain and its anatomical location allows for thorough investigation. In addition, findings that are obtained from studying stroke in the retina can be translated to better understand ischemic retinopathies, such as diabetic retinopathy and retinopathy of prematurity which are the leading causes of blindness in the industrial world. These blinding diseases happen to also stem from compromised blood supply to the neurons of the retina. This proposal seeks to understand how blood vessels degenerate in ischemic diseases of the CNS by using the retina as a model. Furthermore, we propose to investigate the role of cholesterol metabolism in modulating inflammation upon ischemia. Ultimately, we hope to interfere with the disease process and promote regeneration of functional blood vessels.

Option(s) linked to the project:

- Clinical Research Profile (Recherche Clinique)
- Data Analyst Profile (Recherche et Analyse de Données Biologiques)
- Experimental Biology Profile (Recherche Expérimentale)