Internship Proposition
(one page max)

Master 2 GP Immunology & ImmunoIntervention (I^3)
2025-2026

Lab:
CR2TI UMR 1064, NANTES ; https://cr2ti.univ-nantes.fr/

Team:
Team 4
Deciphering organ immune regulation in inflammation and transplantation (DORI-t)

Name and position of the supervisor:
Sophie CONCHON (DR/Inserm) and Amédée RENAND (CRCN Inserm)

Email of the supervisor:
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Candidate (if internship filled):

Title of the internship:
CRISPR Cas9-mediated invalidation of hepatocyte factors interacting with lymphocyte partners involved in the emergence of autoimmune hepatitis.

Summary of the internship proposal:
The liver is an organ with multiple metabolic and detoxification functions, necessary to the body. It is also the first point of passage for blood from the digestive tract, and receives many exogenous bacterial and dietary products. In order to maintain liver function, the immune system in the liver is biased towards tolerance. However, autoimmune liver diseases, including autoimmune hepatitis, demonstrate the limits of hepatic tolerance.
We are trying to better understand the immune mechanisms involved in this disease, and the events that cause it. To this end, we have carried out studies on lymphocyte populations present in the blood of patients, and characterized them at single cell RNAseq level. This has enabled us to identify transcripts potentially involved in the function of these lymphocytes and in self-reactivity. We are also developing a mouse model to test our mechanistic hypotheses, particularly in terms of the interaction between immune cells (lymphocytes) and liver parenchyma cells (hepatocytes).
During the Master 2 internship, the student will participate in the development of gene invalidation techniques using the CRISPR-Cas9 approach on murine hepatocyte lines, then in vivo. This approach will enable us to study the involvement of some candidate genes in our mouse model, using AAV-CRISPR-CAS9 to target immune ligands on the hepatocyte surface. The ultimate aim of this project is to identify factors involved in hepatic autoimmunity, in order to propose new therapeutic approaches.
Proposed Techniques: CRISPR-CAS9 IN VITRO, CELL CULTURE, TRANSFECTION, RT-QPCR
Option(s) linked to the project:

☐ Clinical Research Profile (Recherche Clinique)
☐ Data Analyst Profile (Recherche et Analyse de Données Omiques)
X Experimental Biology Profile (Recherche Expérimentale)

Form to be sent by email to : gpi3@univ-nantes.fr