

Internship Proposition
(one page max)

Master 2 GP Immunology & ImmunIntervention (I³)
2025-2026



Lab: CR2TI

Team: 6

Name and position of the supervisor: Jeremie Poschmann CRCN Inserm

Email of the supervisor: jeremie.poschmann@univ-nantes.fr

Candidate (if internship filled):

Title of the internship: Deciphering Bone Marrow–Lung Immune Crosstalk During Pneumonia in Metabolically Altered Mice

Summary of the internship proposal:

This 6-month research internship focuses on understanding how metabolic status and systemic inflammation shape immune responses in pneumonia by analyzing the bone marrow and lung immune compartments. The project leverages scRNA-seq datasets obtained from mice with experimentally induced pneumonia, including both wild-type and LDL receptor knockout animals fed either normal chow or a high-fat diet.

The intern will analyze scRNA-seq data from bone marrow to identify changes in immune cell composition, transcriptional programs, and hematopoietic lineage bias under different metabolic and inflammatory conditions. These findings will be integrated with parallel scRNA-seq datasets from the lung to investigate systemic–local immune crosstalk, particularly how bone marrow-derived cells may influence or reflect pulmonary immune responses.

In addition, the intern will perform spatial transcriptomics on lung tissue to map immune cell localization and interactions within the lung microenvironment during pneumonia. This will provide spatial context to transcriptional changes and enhance the understanding of how metabolic alterations impact immune cell recruitment, positioning, and function in infected lung tissue.

Using bioinformatic tools such as Seurat, Scanpy, and pathway enrichment analyses, the intern will contribute to uncovering how metabolic dysregulation alters immune priming and effector functions across compartments. This work will provide novel insights into the systemic regulation of lung immunity and may identify potential targets for host-directed therapies in infectious and inflammatory diseases.

Option(s) linked to the project:

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

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