Internship Proposition
(one page max)

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

Lab: CR2TI UMR 1064

Team: 1 supervised by E Chiffoleau/R Josien

Name and position of the supervisor: E Chiffoleau, CR Inserm

Email of the supervisor: Elise.Chiffoleau@univ-nantes.fr

Candidate (if internship filled):

Title of the internship: Investigate the function of the immune checkpoint CLEC-1 in cross-presentation of dead cell-associated antigens by conventional type 1 dendritic cells and in anti-tumor immunity.

Summary of the internship proposal:

We have previously shown that the CLEC-1 receptor expressed by dendritic cells corresponds to a sensor of cell death and acts as an immune checkpoint to prevent acute immune response and collateral tissue damage following injury. Thus, we showed that CLEC-1 signaling blockade by genetic ablation or antagonistic antibodies can restore an effective anti-tumor immune response and prolongs survival in pre-clinical tumor mouse models. Mechanistically, we observed that blocking CLEC-1 increases the cross-presentation of dead cell-associated antigens by conventional type 1 dendritic cells (cDC1). However, the underlying mechanisms and the precise step in which CLEC-1 limits antigen cross-presentation in cDC1 remains to be elucidated.

The aim of this internship is to investigate the function of CLEC-1 in cDC1 in key processes of antigen cross-presentation and anti-tumor immunity such as:

1) localization in endo/phagosomes following internalization of necrotic material,
2) phagosome maturation and antigen processing,
3) secretion of cytokines and chemokines,
4) $CD8^+$ T activation and modulation of tumor microenvironment.

This will be achieved by cell culture and flow cytometry experiments on mouse cDC1 using *Clec1a* gene-deficient mice in *in vitro* and *in vivo* tumor models using sophisticated antigen-specific systems (OVA and OT-1 transgenic mice).

In the long term, a better understanding of the role of CLEC-1 in antigen presentation by cDC1 should help to consider its blockade as a new therapeutic tool for restoring an effective anti-tumor immune response in cancer patients.

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)

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