

Internship Proposition
(one page max)
Master 2 GP Immunology & ImmunIntervention (I³)
2024-2025



Lab: Center for Research in Transplantation and Translational Immunology (CR2TI, UMR1064)

Team: 4 (Team leader: Sophie Brouard)

Name and position of the supervisor:
Hoa Le Mai, researcher

Email of the supervisor: le.hoa-mai@univ-nantes.fr

Candidate (if internship filled): Not applicable

Title of the internship:

Characterization of new mechanisms of action of regulatory B cells in kidney transplantation

Summary of the internship proposal:

Among the available treatment options, transplantation remains the most effective for patients with end-stage kidney failure. However, it requires lifelong immunosuppressive therapy to ensure stable graft function. Although these treatments have reduced the risk of acute rejection, they have numerous side-effects and do not prevent the risk of chronic rejection. We report that patients with good and stable graft function harbor an increase of B cells with an inhibitory/regulatory phenotype. These cells have the capacity to prevent the proliferation of CD4⁺ and CD8⁺ effector T cells by a mechanism partially dependent on Granzyme B (GzmB). Taken together, these findings support a potential role for Granzyme B-expressing regulatory B cells (Breg) in transplantation and raise the question of their use in therapy to prevent rejection. However, the characterization of these cells and their mechanisms of action remains incomplete, particularly regarding the molecules involved in their function and their complementarity with GzmB. We performed some single cell RNAseq and identified some candidates that are only expressed by Bregs and may be involved in their function. Under the supervision of the project's scientific director, the student will study the involvement of these molecules in the mechanisms of action of regulatory B cells in kidney transplantation.

Techniques: Cell culture, flow cytometry, western-blot, qPCR, molecular biology, data analysis.

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)**