Internship Proposition
(one page max)
Master 2 GP Immunology & ImmunoIntervention (I^3)
2026-2027

Lab: CR2TI

Team: 4

Name and position of the supervisor: Nicolas Degauque / Antoine Néel

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Candidate (if internship filled):

Title of the internship: $CD8^+$ $GPR56^+KLRG1^+$ T Lymphocytes as Effectors of Renal Microvascular Injury in ANCA-Associated Vasculitis

Summary of the internship proposal:

Scientific Context. ANCA-associated vasculitides (AAV) are rare, life-threatening small-vessel inflammatory diseases whose pathophysiology remains incompletely understood. While ANCA-mediated myeloid activation constitutes the initiating event, it does not fully account for the persistence or distribution of vascular lesions — the partial decoupling between ANCA titers and clinical disease activity arguing for the existence of independent adaptive effectors. Our preliminary data identify, at AAV diagnosis, an expansion of $CD8^+$ $GPR56^+KLRG1^+$ T lymphocytes within a profoundly remodeled CD8 compartment. Co-expression of GPR56 defines a qualitatively distinct state: enhanced cytotoxic capacity and direct sensing of the microenvironment via its ligands TG2 and collagen III, two ligands overexpressed in areas of renal fibrosis associated with AAV.

Objectives. This internship aims to define the phenotype, longitudinal dynamics, and cytotoxic activity toward the microvascular endothelium of $CD8^+$ $GPR56^+KLRG1^+$ T lymphocytes in AAV, and to determine whether GPR56 engagement modulates their effector behavior.

Methods. Analyze PBMCs from AAV patients (NALVANCA biocollection, CRB CHU Nantes) at three timepoints (diagnosis, under rituximab, post-treatment) versus healthy volunteers. Quantification by spectral cytometry (activation, differentiation, cytotoxicity, transcription factors) of $CD8^+$ $GPR56^+KLRG1^+$ T frequency and phenotype. Co-culture with CMV peptide pools to assess antiviral specificity. Co-culture of sorted $CD8^+$ subpopulations with primary human microvascular endothelial cells to assess their capacity for adhesion, endothelial activation, and injury. Specific receptor blockade to test GPR56 dependence

Expected Outcomes. This project will establish whether $CD8^+$ $GPR56^+KLRG1^+$ T lymphocytes are direct pathogenic effectors of microvascular injury in AAV or merely markers of systemic inflammatory status. Mechanistically, demonstrating GPR56-dependent endothelial cytotoxicity would, for the first time, identify a $CD8^+$ effector of adaptive vascular injury in AAV. From a translational standpoint, the longitudinal dynamics of this subpopulation could underpin a predictive monitoring strategy for relapse risk and open avenues for targeted therapeutic intervention.

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