

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



Lab: CR2TI

Team: 2

Name and position of the supervisor: Guillonneau Carole, Director of Research

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Candidate (if internship filled):

Title of the internship: Mutated IL-34 for Immunotherapy

Summary of the internship proposal:

In immune-mediated diseases such as neurodegenerative diseases, an imbalance in the immune system is observed. Most available drugs are inhibiting different components of the innate and/or adaptive immune systems, but the type of inhibition may be broad and lack selectivity, and currently available drugs on the market lack the capacity to restore the immune balance. Hence, long-lasting efficacy (and potentially even remission) remains elusive in most immune-mediated diseases. Therefore, new treatments are needed that will be more specific and with less side effects and that would allow at least to decrease the use of immunosuppressors.

Cytokines and their receptors are powerful tools for controlling immune responses, they play an important role in the evolution of diseases and could serve as new mediators of immune tolerance. The discovery in 2008 of IL-34 as a new ligand of CSF-1R opened new perspectives on the differentiation and function of the monocytic lineage. We described recently the immunoregulatory properties of wild type IL-34 in rat and human and its potential to prevent graft rejection, graft versus host disease (GVHD) and experimental autoimmune encephalomyelitis (EAE).

However, IL-34 half-life could hamper its therapeutic activity and IL-34 and CSF-1 are competing for the same receptor CSF-1R, thus development of an improved format of IL-34 with increased affinity and longer half-life is needed. The general objective of this project is to design and select an improved format of IL-34 for more efficient and/or more targeted uses, to better define the mechanism of actions of IL-34, and make proof of concept in vivo in animal models. The internship project will use cell culture techniques, flow cytometry, molecular biology and in vivo models.

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