UFR de Chimie et de Biologie
UNIVERSITÉ Grenoble Alpes

Master's degree in Biology – Chemistry-Biology Department

Master 2 internship project
Year 2024-2025

Laboratory/Institute: IAB - Institute for Advanced Biosciences / EFS
Director: Pr Pierre Hainaut
Team: Epigenetics, Immunity, Metabolism, Cell signaling and Cancer
Head of the team: Pr Pierre Hainaut
Subgroup: Immunobiology and Immunotherapy of chronic diseases (Dr Philippe SAAS)
Name and status of the scientist in charge of the project:
Dr Caroline Aspord, CR EFS **HDR: yes ☒ no ☐**
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Program of the Master's degree in Biology:

☒ Immunology, Microbiology, Infectious Diseases ☐ Structural Biology of Pathogens
☐ Physiology, Epigenetics, Differentiation, Cancer ☐ Neurosciences and Neurobiology

Title of the project:

Exploration of the metabolic features of effector cells in the context of melanoma

Objectives (up to 3 lines):

✓ Explore the metabolic features of circulating and tumor-infiltrating effector cells (Tconv, γδT, NK) from melanoma patients using the SCENITH method
✓ Analyze the link between the metabolism and the phenotypic and functional features of immune cells, and establish potential correlations with the clinical outcomes
✓ Harness metabolic reprogramming to reverse tumor-induced immune subversion

Abstract (up to 10 lines):

The understanding of the mechanisms involved in subversion of immunity by tumors is crucial to elaborate new therapeutic strategies. Some melanomas escape immune control, but the bases of this subversion are not yet fully elucidated. Recent evidences suggest that energetic metabolism reprogramming is critical for cancer and immune responses. This project will focus on the exploration of the metabolic features of effector cells (Tconv, γδT, NK) using the flow cytometry-based SCENITH method. Analyses will be performed on immune cells from healthy donors as well as on circulating and tumor-infiltrating immune cells from melanoma patients. This study will allow to better understand the impact of tumors on the metabolic profile of immune cells, and to pave the way for potential new therapeutic strategies.

Methods (up to 3 lines):

Blood and tumor samples from melanoma patients and/or healthy donors, tumor cell lines
Multiparametric flow cytometry, cell culture, immune cell subsets purification,
Phenotypic, functional and metabolic assays

Up to 3 relevant publications of the team:

● Camille Niveau, Eleonora Sosa Cuevas, Benoît Roubinet, Mylène Pezet, Michel Thépaut, Stéphane Mouret, Julie Charles, Franck Fieschi, Ludovic Landemarre, Laurence Chaperot,

Philippe Saas, Caroline Aspord. Melanoma tumor-derived glycans hijack Dendritic Cell subsets through C-type Lectin Receptor binding. Immunology. 171(2):286-311, 2024.

● Eleonora Sosa Cuevas, Benoît Roubinet, Stephane Mouret, Michel Thépaut, Florence de Fraipont, Julie Charles, Franck Fieschi, Ludovic Landemarre, Laurence Chaperot, Caroline Aspord. The melanoma tumor glyco-code impacts human dendritic cells' functionality and dictates clinical outcomes. Front Immunol 14:1120434, 2023

● Pauline Girard, Julie Charles, Camille Cluzel, Emmanuelle Degeorges, Olivier Manches, Joel Plumas, Florence De Fraipont, Marie-Therese Leccia, Stephane Mouret, Laurence Chaperot, Caroline Aspord. The features of circulating and tumor-infiltrating γδT cells in melanoma patients display critical perturbations with prognostic impact on clinical outcome. OncoImmunol 8(8):1601483, 2019

Requested domains of expertise (up to 5 keywords): Immunology, cancerology, cell biology