**Master 2 internship project**

**Year 2023-2024**

**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):

✓ Set up the SCENITH method with effector cells from healthy donors (Tconv, γδT, NK)

✓ Characterize the metabolic features at steady state, upon activation of the cells or after coculture with tumor cells

✓ Explore the metabolic profile of circulating and tumor-infiltrating effector cells from melanoma patients and establish potential correlations with the clinical outcomes

Abstract (up to 10 lines):

The understanding of the mechanisms of subversion of immunity by tumors is crucial to elaborate new therapeutic strategies. Melanoma succeeds to 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 at basal state, upon activation, or after coculture with tumor cells, 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:

● Eleonora Sosa Cuevas, Philippe Saas, Caroline Aspord. Dendritic Cell Subsets in Melanoma: Pathophysiology, Clinical Prognosis and Therapeutic Exploitation. Cancers 15: 2206, 2023

● Eleonora Sosa Cuevas, Laurissa Ouaguia, Stephane Mouret, Julie Charles, Florence de Fraipont, Olivier Manches, Jenny Valladeau-Guilemond, Nathalie Bendriss-Vermare, Laurence Chaperot, Caroline Aspord. BDCA1+ cDC2s, BDCA2+ pDCs, and BDCA3+ cDC1s reveal distinct pathophysiologic features and impact on clinical outcomes in melanoma patients. Clin Transl Immunol 9(11):e1190, 2020

● 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