Master's degree in Biology – Chemistry-Biology Department

Master 2 internship project
Year 2022-2023

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 Laurence CHAPEROT)
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:

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

Title of the project:

Immuno-monitoring of melanoma patients treated by immunotherapy targeting immune checkpoints

Objectives (up to 3 lines):

✓ Immune profiling of patients before and during the treatment
✓ Definition of predictive factors of response
✓ Understanding the mechanism of action of immunotherapies targeting immune checkpoints

Abstract (up to 10 lines):

Immunotherapy represents a therapeutic revolution for melanoma treatment. Immune checkpoints blockers (ICB) such as anti-PD1 antibodies allow a sustained response rate of 40%. However, 60% of patients do not respond and/or undergo many side effects. The objective of the project is to better understand the impact of anti-PD1 on the major players of the immune system, and to define its mechanism of action. We will perform an immuno-monitoring of melanoma patients treated with anti-PD1 before and during the course of the treatment. We will analyze the phenotypic and functional features of dendritic cell subsets (cDC2s, pDCs, cDC1s) and effector cells (NK, iNKT, Tγδ and Tαβ) by multiparametric flow cytometry and LUMINEX technology. This study will allow a better understanding of the mechanism of action of ICB and the identification of predictive biomarkers of response, leading to a better orientation of therapeutic choice and improvement of clinical benefit for the patients.

Methods (up to 3 lines):

✓ Biobanking of patients' samples (blood)
✓ Phenotypic and functional analyses of different immune cell subsets (DC subsets, Tαβ, NK, Tγδ, iNKT) by multi-parametric flow cytometry and LUMINEX dosages

Up to 3 relevant publications of the team:

● 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

● Aspord, MT. Leccia, J. Charles, J. Plumas. Plasmacytoid dendritic cells support melanoma progression by promoting Th2 and regulatory immune responses through OX40L and ICOSL. Cancer Immunology Research 1(6):402-415, 2013

Requested domains of expertise (up to 5 keywords):

Immunology, cancerology, cell biology