Master's degree in Biology – Chemistry-Biology Department

Master 2 internship project
Year 2026-2027

Laboratory/Institute: Institute for Advanced Biosciences **Director:** Christophe Arnoult
Team: ResistHem **Head of the team:** Sylvain Carras / Pascal Mossuz

Name and status of the scientist in charge of the project: Anouk Emadali and Sylvain Carras
HDR: yes ☒ **no** ☐

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Program of the Master's degree in Biology:

☐ Microbiology, Infectious Diseases and Immunology ☐ Biochemistry & Structure
☒ Physiology, Epigenetics, Differentiation, Cancer ☐ Neurosciences and Neurobiology

Title of the project: Investigate the impact of EHHADH reactivation on lymphoma progression

Objectives (up to 3 lines):

Characterize the effects of EHHADH modulation on lipid utilization, cellular energetics, epigenetic profiles and transcriptional networks in Diffuse Large B Cell Lymphoma. Determine whether EHHADH contributes to treatment resistance and evaluate its relevance as a prognostic indicator and therapeutic target.

Abstract (up to 10 lines):

We have recently uncovered a novel prognostic signature in diffuse large B-cell lymphoma (DLBCL) driven by the aberrant reactivation of tissue-restricted genes. Among these, EHHADH, a key enzyme of hepatic peroxisomal β-oxidation, is aberrantly expressed in ~20% of patients, reveal an intriguing metabolic rewiring in lymphoma cells. We hypothesize that EHHADH reactivation is not merely a biomarker of disease aggressiveness, but a functional driver of tumor adaptation, coupling lipid metabolic reprogramming with epigenetic remodeling and treatment resistance. To test this, we are using engineered lymphoma cell models with exogenous expression or genetic ablation of EHHADH. We aim to dissect how this metabolic enzyme reshapes energy metabolism with a focus on lipid utilization, chromatin landscapes, transcriptional programs, and tumor cell phenotypes. This project will provide a comprehensive characterization of a newly identified metabolic-epigenetic vulnerability in DLBCL. Beyond its prognostic value, EHHADH may emerge as a novel actionable target, opening new therapeutic perspectives in aggressive B-cell lymphomas.

Methods (up to 3 lines):

Cell culture, Molecular Cloning, Lentiviral Transduction, Metabolic test (ATP production, SeaHorse), Lipidomics (GC-MS/MS, in collaboration), Epigenomics (Cut&Tag, in collaboration), RNA-seq, Cell biology (viability, proliferation and drug treatment assays)

Up to 3 relevant publications of the team:

Garcia-Sandoval et al. CYCLON is a nucleolar protein that regulates pan-cancer cell fitness through ribosome biogenesis. bioRxiv. Preprint posted online May 15, 2026:2026.05.13.724782.

doi:10.64898/2026.05.13.724782

Montaut et al. A prognostic signature based on ectopic reactivation of 8 tissue-specific genes in Diffuse Large B Cell Lymphoma. medRxiv. Preprint posted online April 27, 2026:2026.04.23.26351580. doi:10.64898/2026.04.23.26351580*

Delrieu et al. BET inhibition revealed varying MYC dependency mechanisms independent of gene alterations in aggressive B-cell lymphoma. Clin Epigenet. 2024;16(1):185. doi:10.1186/s13148-024-01788-7

Requested domains of expertise (up to 5 keywords):

Cancer Cell Biology, Onco-Hematology, Metabolism, Epigenetics