Master 2 Internship

Molecular Mechanisms of Rab Protein-Mediated Lipid Metabolism

Host Laboratory: ChemSenSim Team, Institut de Chimie de Nice - Université Côte d'Azur
Duration: 6 months (Master 2 internship)
Start Date: January 2026
Location: Institut de Chimie de Nice, in collaboration with Centre Méditérannéen de Médecine Moléculaire (*Université Côte d'Azur*)
Website: https://lab.chemsensim.fr/

Project Description

We are seeking for a Master 2 student with strong skills in molecular modeling simulations and a background in biology/structural biology to join a collaborative project at the interface of computational and experimental research.

This interdisciplinary project will involve two Master 2 students working in close collaboration: one focusing on the numerical approach through molecular modeling, and the other conducting experimental studies in biology.

Rab proteins, small GTPases governing endocytic trafficking, are emerging as pivotal regulators of cellular metabolism. Our team has demonstrated that Rab proteins control glucose and lipid homeostasis, and recently identified a Rab protein that represses lipid β-oxidation in the liver. While disrupting its intracellular localization reduces lipid droplet content, we have also identified a mutation that decreases lipid droplets without altering Rab localization, suggesting that it affects the protein's interaction with a partner responsible for repressing lipid β-oxidation.

The goal of this project is to identify and characterize the partner(s) of this Rab protein and understand how this interaction regulates lipid metabolism. The project will combine structural chemistry, molecular biology, and cell biology approaches to:

- Identify partners of the Rab protein using *in silico* approaches.
- Map the interaction sites between the Rab protein and its partners.
- Verify the in silico prediction by various experimental protocols.

This work has the potential to uncover, for the first time, the molecular mechanism linking a Rab protein to the repression of lipid β-oxidation.

Candidate Profile

The candidate should have a training in molecular modeling, computational biology, structural biology, biophysics, or a related field, with hands-on experience in molecular dynamics simulation and docking. The candidate should demonstrate an experience in Linux environments, and be capable of writing data analysis scripts (Python or equivalent). Knowledge of protein structure is required.

We are looking for a motivated, autonomous student with a strong interest in interdisciplinary research at the interface of computational chemistry, structural biology, and cell biology, and the ability to work effectively in a multidisciplinary team.

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We Offer

- A stimulating scientific environment within the ChemSenSim Team at Université Côte d'Azur with local computational resources to perform the calculations.
- Direct collaboration with an experimental biology laboratory (C3M), ensuring rapid validation of computational predictions.
- Training in cutting-edge computational tools.

Application

Applicants should send the following documents in a single PDF file:

- CV (including academic background and technical skills),
- Motivation letter,
- Contact information for one academic referee or a recommendation letter.

Send applications to: Jeremie.topin@univ-cotedazur.fr, and indicate "Application to the *Internship RABINBOX*" in the subject line.

Deadline for applications: November 2025

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