

**CMD InnoCARE (Innovation pour les maladies
Cardiovasculaires, métaboliques et REspiratoires)**
Master 2 Internship proposal (2024-2025)
1 page maximum



Profile(s) linked to the project:

- Experimental Biology (*Recherche expérimentale*)
- Research and Biological Data Analysis (*Recherche et analyse de données biologiques*)
- Clinical Research (*Recherche clinique*)

Lab: L'institut du Thorax

Team: Cardiometabolic disease (4)

Name and position of the supervisor: Xavier Prieur (PU)

Email of the supervisor: xavier.prieur@univ-nantes.fr

Candidate (if known):

Title of the internship: **The role of Endoplasmic reticulum, lipid droplet and mitochondria dialogue in adipocytes homeostasis**

Summary of the internship proposal:

Obesity prevalence is increasing worldwide and adipocyte dysfunction is central to the development of obesity-related cardiometabolic complications. Recently, the regulation of organelles contacts sites emerges as an important way to control metabolic flexibility, i.e. the ability to adapt to nutrient availability. Ongoing work in the laboratory raises the question of the importance of the Endoplasmic reticulum (ER)/lipid droplet (LD)/mitochondria structural organization in the control of metabolic flexibility of the adipocytes in the context of obesity. **This master project will explore, in vivo and in vitro, the importance of the ER/LD/mitochondria organization in controlling adipocytes good health and most specifically lipid storage.**

To this end, we generated genetic tools to modulate the contact sites and to assess the functional consequences, *in vitro* and *in vivo*. To study the contact sites, we are using cutting-edge microscopy methods: proximity ligation assay, live tracking of lipids, super-resolution microscopy, electronic microscopy. We developed lipid fluxomic assays to assess the lipid handling in cells. We have all the expertise to study the phenotypic consequences of contact sites manipulation on metabolic health and this internship will include animal physiology.

Combining cell biology of adipocytes, biochemical study of lipids and mouse metabolic phenotyping, this interdisciplinary project will provide new insight on the mechanism that regulates the adipocytes good health in the context of obesity.

Previous publication of the team on the topic:

Combot Y et al. Seipin localizes at endoplasmic-reticulum-mitochondria contact sites to control mitochondrial calcium import and metabolism in adipocytes. *Cell Rep.* 2022 Jan 11;38(2):110213. doi: 10.1016/j.celrep.2021.110213.PMID: 35021082