

**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: INSERM U1087

Team: Equipe 1, Human Genetics

Name and position of the supervisor: Salam IDRIS, Postdoctoral fellow

Email of the supervisor: salam.idriss@univ-nantes.fr

Candidate (if known):

Title of the internship: Refining Erythropoietin Regulation and Expression Using Cutting-Edge Technologies

Summary of the internship proposal: Our laboratory (B. GARDIE's team) is deeply committed to exploring the multifaceted aspects of Erythropoietin (EPO) and its wide-ranging implications in various physiological and pathological contexts. EPO is a vital regulator of erythropoiesis whose expression is tightly regulated in response to local changes in oxygen partial pressure, i.e., during hypoxia or anemia. Its principal function is to regulate erythropoiesis, the production of red blood cells in the bone marrow, by stimulating the proliferation and differentiation of erythroid progenitor cells. Through focusing on novel non-coding **germline EPO mutations**, identified in patients with **hereditary erythrocytosis**, we opt to understand the regulation and expression of EPO. To address these aspects, in this project we use cutting-edge technologies and innovative methods by differentiating patients derived **induced pluripotent stem cells** into EPO-producing cells (wildtype and mutant) that recapitulate the features of disease in question. These cells will then be used to perform numerous next-generation sequencing (NGS) approaches to refine regulatory elements controlling EPO gene expression, map chromatin dynamics and decipher long-range chromatin interactions within the EPO locus (**ATAC-seq, CUT&RUN, 4C-seq**). This project will enrich the candidate's profile at the scientific and experimental level and enable him/her to master different molecular and functional techniques such as stem cell culture and differentiation, NGS methodologies, in addition to data analysis.