

**CMD InnoCARE (Innovation for Cardiovascular, metabolic and
REspiratory diseases)**

Master 2 Internship proposal (2026-2027)

1 page maximum



Profile(s) linked to the project:

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

Lab: UMR1087

Team: TeamIII

Name and position of the supervisor: Vincent SAUZEAU, Team leader

Email of the supervisor: vincent.sauzeau@univ-nantes.fr

Candidate (if known): Marylou VOILLET

Title of the internship: Analysis of smooth muscle cell plasticity: a multi-omics approach to identify new therapeutic targets in vascular and pulmonary diseases

Summary of the internship proposal:

Under physiological conditions, mature smooth muscle cells (SMCs) express a set of genes that confer a contractile phenotype. However, this cellular differentiation is not definitive, and in many pathological conditions, SMCs lose their contractile phenotype and, as in the embryonic state, become cells that proliferate, migrate, and secrete extracellular matrix. This dedifferentiation of SMCs plays an essential role in the tissue remodeling involved in pathologies such as hypertension, atherosclerosis, or severe asthma. Currently, pharmacological treatments have no effect on this plasticity of SMCs, which contributes significantly to vascular and bronchial pathologies.

Thus, CMLs represent a key therapeutic target for the treatment of vascular and bronchial diseases. Our goal is to control the phenotype of CMLs and reverse tissue remodeling in patients with these conditions. Our objective will be, through a multi-omics approach, to understand the mechanisms responsible for the phenotypic conversion of vascular and bronchial CMLs and to identify new therapeutic targets capable of reversing or limiting the remodeling associated with hypertension, atherosclerosis, or severe asthma.