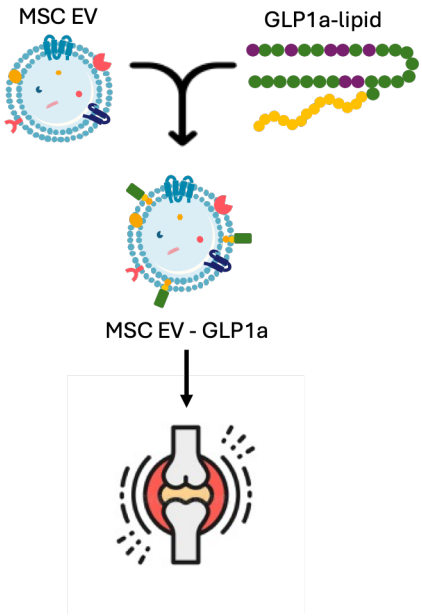
Master Internship (6 months) : Peptide Functionalized Extracellular Vesicles for Osteoarthritis Therapy

Location: IRMB (INSERM U1183), University of Montpellier, France.

Supervision : Dr Pascal Verdié, Pr Marie Morille .



Project : Extracellular vesicles (EVs) derived from mesenchymal stromal cells (MSCs) are emerging as promising biologics for regenerative medicine. This project aims to engineer MSC-derived EVs with lipidated GLP-1 receptor agonists to develop next-generation EV-based therapeutics for osteoarthritis. By combining the intrinsic regenerative and immunomodulatory properties of MSC-EVs with targeted receptor activation, this approach seeks to enhance the therapeutic potential of EVs for joint diseases.

Missions: The student will contribute to the surface engineering of MSC-derived extracellular vesicles (EVs) using fluorescently labelled lipidated semaglutide. Well-characterized MSC-EV batches will be produced and supplied by a dedicated technician within the project. The student will focus on EV functionalization, purification of engineered EVs, and quantitative assessment of the surface engineering process. The project will involve the characterization and quantification of EV modification using complementary analytical approaches, including nanoparticle tracking analysis (NTA), Electrophoretic Light Scattering (ELS), nano-flow cytometry (nanoFCM). Building on protocols previously developed in the laboratory for protein association to EV surfaces, the student will be responsible for optimizing the semaglutide association process and establishing robust characterization methods. Depending on project progress, the student may also participate in preliminary studies investigating the interaction of engineered EVs with osteoarthritis-relevant cell types.

Environment : The internship will be conducted at the **Institute for Regenerative Medicine and Biotherapies (IRMB)** in Montpellier within a multidisciplinary team specialized in extracellular vesicles, nanomedicine, and regenerative medicine. The project will also benefit from the support of **OBBI (Occitanie Biomaterials and Biotherapies Integrator)**, located in the same building, providing access to state-of-the-art facilities for EV production, characterization, imaging, and bioprocessing. Finally this project will be in close collaboration with IBMM (P. Verdié, G. Subra) for peptide characterization.

Candidate Profile. We seek a highly motivated Master 2 student in Biomedical Sciences, Biotechnology, Pharmaceutical Sciences, Bioengineering, Nanomedicine, or a related field. Experience in cell culture, molecular biology, flow cytometry, or nanoparticle characterization will be appreciated. This internship is intended as a gateway to a fully funded PhD project on the same topic.

Application : Please submit your CV, Motivation letter to marie.morille@inserm.fr.