Internship offer
M2 Musculo-Skeletal system, Locomotion, Exercise (MuSkLE)

Title of the Internship: Mechanical loading and immune cells recruitment in arthritis

Laboratory (name, n°, website):

SAINBIOSE (Health, Engineering, Biology – St Etienne) INSERM U1059, https://sainbiose-lab.fr/

Research team (name, website):

Team LBTO, https://sainbiose-lab.fr/research-2/lbto_team/

Supervisor to contact (name, email address):
Professor Hubert MAROTTE, hubert.marotte@chu-st-etienne.fr

Project description including a short introduction, aim/objectives and methods/approach to be used

Rheumatoid arthritis is a major musculoskeletal disorder, with limb/peripheral deformities, pain, and poor quality of life for hundreds of thousands in Europe. A lifelong disease, there is no cure for arthritis.

We have found that infiltration and activation of immune cells in the joints is concomitant to pathological alterations in articular and periarticular cells such as fibroblast-like synoviocytes and osteoblasts. Understanding the interplay between those cells is paramount to unravel new pathological mechanisms and block them to alleviate arthritis. We propose to explore the effects of two therapeutics in arthritis. The first strategy is to block the mechanical stimulation of articular cells, and the second one is to prevent pathological communication between articular cells and immune cells.

The candidate will characterize the distinct benefits of each strategy, as well as combined, it terms of joint integrity and cardiovascular outcomes. The internship includes biochemistry (bioassays), molecular biology (qPCR), and histology (of the joint).

References:

- **Caire et al, Front Immunol 2021.** YAP/TAZ: Key Players for Rheumatoid Arthritis Severity by Driving Fibroblast Like Synoviocytes Phenotype and Fibro-Inflammatory Response. doi: 10.3389/fimmu.2021.791907.
- **Courbon et al, Blood 2023.** Bone-derived C-terminal FGF23 cleaved peptides increase iron availability in acute inflammation. doi: 10.1182/blood.2022018475.
- **Courbon et al, Sci Rep 2018.** Early sclerostin expression explains bone formation inhibition before arthritis onset in the rat adjuvant-induced arthritis model. doi: 10.1038/s41598-018-21886-w.

Skills required:

Interest in osteoarticular disease and new molecular pathways for therapeutics. Lab work basics and prior knowledge in some of the above-mentioned techniques.