Sujet de stage (1er semestre 2024)

Titre	**Organoïde de tendon construit à partir de matériaux électrospinnés / Tendon organoid on electrospun materials**
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Mots clés	Electrospinning, ingénierie tissulaire, matrice extracellulaire
Descriptif du sujet	**Background**: Up to now, tendon engineering has been developed in the framework of regenerative medicine, but not applied to preclinical drug screening. **Project aim**: Generate a tendon organoid by the culture of progenitor cells on electrospun matrix made of Nylon or other materials under static and dynamic conditions. Characterize the neo-synthesized extracellular matrix (ECM). **Project description**: The electrospun scaffold will be prepared following protocols previously validated in the lab. Tendon cells or progenitors will be seeded on Nylon electrospun scaffolds and cultured under static or dynamic (stretching conditions). Tendon organoids will be characterized from both mechanical and biological aspects. The composition and spatial organization of the neosynthesized extracellular matrix will be assessed with immunohistochemistry. The local Young modulus (E) of each scaffold will be measured with a Chiaro nanoindenter system (Optics 11) mounted on an optical microscope. AFM measurements will also be performed to determine elastic and viscoelastic properties of biohybrid materials at the fiber scale. Depending on the project's progress, we also plan to alter collagen and/or the whole extracellular matrix by glycation, to mimic an altered tendon due to diabetis or ageing. **Project impact:** Once the organoid will be produced and characterized, specific drugs will be applied to evaluate alterations of the tissue. This should lead to a new in vitro evaluation tool as an alternative method to animal trials.
Profil recherché	En M2 ou école d'ingénieur, le/la candidat(e) aura une première expérience en mise en forme de biomatériaux et culture cellulaire, et/ou de caractérisation de la matrice extracellulaire
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