Master assignment

Engineering 3D microniches mimicking the mechanical properties of nondegenerated and degenerated cartilage

While it is well known that osteoarthritis leads to changes in mechanical properties of articular cartilages, due to changes in the extracellular matrix (ECM) production and breakdown, little is known about how this affects the individual cells inside the cartilage tissue. The goal of this project is to engineer small 3D microniches, using microfluidic devices, that mimic the mechanical properties of non-degenerated and degenerated cartilage.



3D microniche with a single cell inside.

Techniques/methods applied in the project:

In this project, you will gain expertise in microgel production, hydrogel chemistry, single cell encapsulation, and depending on personal preferences, you will can also learn how to do mechanical characterisation of the microgels, perform fluorescent immunostainings, and gain experience in microscopy.

Supervision

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