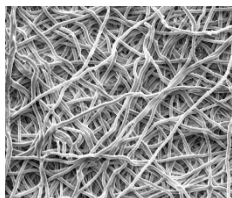
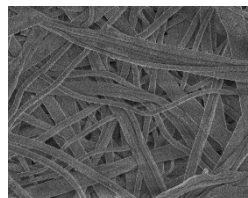


Master project

Optimization of the post-treatments on electrospun silk fibroin sheets to maintain both stability and wettability



Treatment



Silk fibroin is receiving increasing attention for biomedical applications. Biocompatibility, cytocompatibility, biodegradability, and low inflammatory reactions of this biopolymer in human body in addition to its good mechanical properties has brought it in the center of attention. We have so far used different fabrication techniques to use this biopolymer for drug delivery and regenerative medicine. Electrospun nanofibrous sheets are one of the closest replications to extracellular matrix. The only issue with application of silk fibroin nanofibers is the need to use some treatments to decrease the solubility of the fibers in aqueous media. Many conventional treatments makes the sheets hydrophobic and change the morphology of fibers which is not of interest for biomedical applications. We are considering to engineer the treatments to make a balance in the level of hydrophobicity and structural changes. You, as the master student, will learn techniques of:

1. Electrohydrodynamic procedures, especially electrospinning
2. Chemical surface treatments to increase the stability and relevant characterisations using water contact angle measurements and FTIR
3. Electron microscopy imaging (SEM)

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Location: IDUN center of Excellence, DTU Health Tech

About IDUN

IDUN is a center of excellence funded by the Danish National Research Foundation and the Villum Foundation. The center is divided into two parts: IDUN Drug and IDUN Sensor, focusing on drug delivery and nanomechanical sensors, respectively.