Silk-supported 3D cultures for epithelial and endothelial cells

Master's degree project available at KTH Biotechnology, AlbaNova

Background:

Spider silk is a natural polymer combining both strength and elasticity. In our group, we work with the functionalized recombinant spider silk protein FN-4RepCT (FN-silk), produced in the bacterium *Escherichia coli*. When subjected to a hydrophobic/hydrophilic interface, the soluble FN-silk protein self assembles into silk-like fibers. By controlling the way FN-silk is exposed to those interfaces, different 3D matrices can be produced. The fibrillar nature of the FN-silk matrices, as well as the protein´s functionalization with an RGD motive from fibronectin, mimic the natural extracellular matrix (ECM). We have previously shown that they are excellent candidates for cell adhesion and growth in vitro. In this way, it is possible to produce physiologically relevant tissue models that can be used for improved drug development.

What can we offer you?

In our lab, we continuously have ongoing projects related to the development and evaluation of our silk materials. We now aim to investigate if and under which conditions FN-silk can be used to improve existing protocols for conventional 3D culture. The hypothesis is that the use of FN-silk-based 3D matrices will provide the cells with an ECM-like support, and thereby improve the adhesion and growth of cells.

Methods:

In order to test this hypothesis, different epithelial and endothelial cell types will be cultured in 3D. Methods that will be used include: mammalian cell culture, production of 3D scaffolds, bright-field and fluorescence microscopy, immunofluorescence staining, and viability assays.

If you are interested, please contact:

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