Culture of cells in bioactive 3D Silk

Master Thesis project available at KTH Biotechnology, AlbaNova

Background
Spider silk has an elegant way of combining strength and elasticity into a protein-based material. A miniature spider silk protein, 4RepCT, can be recombinantly produced in *E. coli* and still maintain the ability to spontaneously form silk-like fibers. We have recently developed a method to create tissue-like constructs in the format of fibers or foams with integrated mammalian cells (Fig. 1). By integrating a specific combination of cell types into a silk with a certain bioactivity, the idea is to create different tissue types *ex vivo*. The bioactivity can either be a growth factor, a receptor agonist or a differentiation factor, or a combination of those.

Present investigation
We have many ongoing projects on cell culture in silk, with different orientation, depending on the tissue we aim to mimic or create. Contact us to see what master projects we have available at the moment, to see if anything would be of interest to you.

Methods
During our cell related projects, several important methods are performed e.g. mammalian cell culture, silk formation, cell proliferation analysis, assays for metabolic activity, differentiation of stem cells, cryosectioning, immunofluorescence of cell markers, differentiation markers, apoptosis etc.

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*Figure 1. Recombinant spider silk with integrated viable cells*