

3D-BioSilk Breast Cancer Model

Master Thesis Project Available at KTH Biotechnology, AlbaNova

Background

Spider silk is a protein-based material combining strength and elasticity. In our laboratory, we work with the recombinant spider silk protein 4RepCT, which maintains the ability to self-assemble in three-dimensional (3D) silk-like structures (*e.g.* foams, fibers and surface coatings). 4RepCT can also be functionalized to harbor motifs from component of the extracellular matrix (ECM), for promoting a firm cell attachment. For example, the cell adhesion motif from fibronectin (FN) can be added to 4RepCT, allowing the formation of FN-silk. Mammalian cells can then be uniformly integrated into FN-silk networks, where they proliferate in 3D conditions miming the *in vivo* tissue environment. The ability to grow cells in our functionalized spider silk has opened up the possibility to create solutions for biomedical and biotechnological applications.

Present Investigation

Despite major advances in the field, there is still a need to develop reliable preclinical models for drug discovery and the study of cancer biology. 3D *in vitro* cancer model has been suggested as a bridge between *in vitro* and *in vivo* models since, compared to 2D cultures, they better mimic ECM and thus tumor microenvironment. To create an innovative tool for cancer research, we are currently establishing a 3D model of breast cancer using FN-silk (Fig. 1).

Contact us if you would like to take part in the characterization of this 3D breast cancer model.

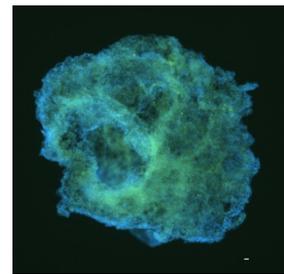


Figure 1. Breast cancer cells growing on 3D-BioSilk.

Methods

During your master project you will gain hands-on experience on several techniques. For example, you will learn how to culture mammalian cells in 2D and 3D-BioSilk, how to perform cell proliferation analysis, mRNA preparation, qPCR, cryosectioning and immunofluorescence analyses.

If you are interested, please contact:

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