



Silk functionalized for medicine and biotechnology



Master's degree project available at KTH Biotechnology, AlbaNova

Background:

Spider silk is a natural polymer combining both strength and elasticity in a very neat way. In our group we work with the recombinant spider silk protein 4RepCT that can be produced in the bacterium *Escherichia coli*. Soluble 4RepCT can be converted into macroscopic silk-like fibers, or processed into surface coatings, films, foams and meshes. In addition, we can add desired functional properties to our silk by dip-coating, genetic engineering and enzymatic coupling. By utilizing these functionalization strategies, silk materials equipped with functions such as, electrical conductance, cell-binding ability, growth factor bioactivity, molecular affinity, antimicrobial properties and enzymatic activity have been realized. The ability to add new functions to our spider silk has opened up the possibility to create bioactive silk-based materials for applications related to medicine and biotechnology.

What can we offer you?

In our lab we continuously have ongoing projects related to design, production and evaluation of functionalized silk. The projects have different focuses depending on the intended application, one example being the use of affinity-silk for diagnostics and immunotherapy. If you think that this sounds interesting, please contact us for a discussion on the current available master's degree projects. Hopefully, any of the available projects will catch your interest.

Methods:

During the work with functionalized silk several biotechnological methods will be utilized, such as molecular cloning, protein expression and purification, gel electrophoresis, Western blot, silk material formulation, bright-field and fluorescence microscopy, surface plasmon resonance (SPR) and quartz crystal microbalance (QCM).

If you are interested, please contact:

Ronnie Jansson, Ph.D., M.Sc.Eng.
ronnieja@kth.se

My Hedhammar, Associate Professor
myh@kth.se

www.kth.se/profile/myh

Location:

KTH Royal Institute of Technology
School of Engineering Sciences in
Chemistry, Biotechnology and Health
Department of Protein Science
AlbaNova University Center
SE-106 91 Stockholm, Sweden

