

Production of spider silk proteins in tobacco seeds

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Spider silk proteins are interesting raw materials for different industrial applications. Unmatched elasticity and tensile strength are the known properties of these versatile biomaterials, accompanied by high temperature tolerance and a very low immunogenicity, which is interesting for medical applications (e.g. coating for implants or active substances). Unfortunately the direct production is not possible due to the strong territorial behaviour of spiders.

Therefore, the production *in planta* is a promising alternative. Various constructs are already expressed in potatoes and tobacco leaves. So far the harvested plant material was stored at -80°C to avoid protein degradation. To circumvent this problem, the expression of spider silk fusion proteins in tobacco seeds is an interesting possibility. Also as a model system for the production in cereals the seed specific expression is of great use. So the long-term stability and the protein purification from tobacco seeds were examined for the further usability of this production platform.

Downstream processing of the spider silk fusion proteins after purification includes polymerisation with bacterial transglutaminase to increase the protein size.