

# Producing artificial silk fibers from brazilian spider genes in bacteria and plant systems

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Spiders are able to produce up to seven different kinds of silk, each one for a specific biological function. Spider silk has drawn attention from all the sections of engineering on account of its superior properties comparing to fibrous materials. Because of their impressive mechanical properties, these proteins provide an important set of material options in the fields of controlled release, biomaterials and scaffolds for tissue engineering. The production of new materials with similar attributes led to an advance in the studies about spidroin, the major protein of spider dragline silk. Dragline silk has a tensile strength that is comparable to Kevlar associated with a reasonable elasticity, and is an extremely strong fiber. Therefore, genetic engineering approaches to generate spider silk and to process the proteins into new useful materials are actively under study. We sequenced expression sequence tags from major ampullate, minor ampullate, flagelliform and tubuliform silk glands from the Brazilian spiders *Nephilengys cruentata*, *Parawixia bistrriata* e *Avicularia juruensis* and were able to identify a number of silk related proteins, including two distinct cDNAs encoding proteins similar to major ampullate spidroin 1 and 2 (MaSp1 and MaSp2) from *Nephila clavipes*, a common garden spider. Using modular engineering approaches, we cloned repetitive modules of spider silk MaSp2 gene in tandem into the pET19b expression vector and obtained recombinant E. coli BL21(DE3)pLysS expressing the engineered PbMasp2. We proceeded the purification using affinity chromatography columns and the purified protein was polymerized and produced a recombinant spider silk in vitro.

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