Biosuture: Recombinant Spider Silk Engineering with Anticancer Agent L-asparaginase

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Spider silk is an outstandingly capable biomaterial. However, due to the territorial and cannibalistic habits of spiders, massive domestication of them is unachievable. Thus, recombinant spider silk garners the interest of the biomimetic silk industry. Among all seven types of silks discovered, MaSp1 protein encodes pH-sensitive N and C-terminal, and a central repetitive domain, which gives rise to its extraordinary strength and toughness with microscopic diameter. This particular property, along with its biocompatibility and biodegradability, makes it a promising candidate for an alternative to the traditional drug delivery system. While the current development of silk-based drug delivery system is mainly based on a two-step procedure, spinning and agent coating, this study aims at investigating a molecular platform of constructing target-specified bio-sutures by creating a fusion protein of MaSp1 (2Rep) and S. cerevisiae derived anticancer agent L-asparaginase II (ASP3).

Awards Won: