

Characterization of spider silk for elucidating the reasons behind its medical success in nerve regeneration applications

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Spider silk has been established as one of nature's most fascinating materials. It has been used in applications such as fishing and wound healing since centuries and in recent years has attracted vivid attention due to its unique strength, toughness, and elasticity [1]. One of the more remarkable applications of the spider silk in medicine is its use for nerve growth and nerve regeneration. The Schwann cells, which are a crucial part of nerve regeneration process, adhere to the spider silk and migrate along it without any inflammatory response or physiological pH changes [2,3]. However, the interaction mechanisms between the cells and the silk is still unknown and therefore the reasons behind the medical success of the silk is unclear.

In this work, we performed systematic studies for the characterization of the silk from the spider *Nephila Edulis*. Attention was given to the morphology (scanning electron microscopy), secondary protein structure (Raman spectroscopy), and mechanical properties (tensile testing). The characterization experiments were accompanied by the medical assessment of the silk in nerve regenerative applications.

References:

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