

REFERENCE
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Construction, bioproduction and characterization of Protein Based Polymers: exploiting the sequence of naturally occurring Elastin and Silk fibroin

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With the development of nano(bio)technologies it is now possible to use amino acids to design and produce genetically engineered Protein-Based Polymers (PBPs). PBPs occur in a wide range of biological systems, fulfilling precise functional roles¹. Its properties are due to the presence of short repeating sequences, such as silk fibroin (GAGAGS) and mammalian elastin (VPGVG). Elastin-Like Polymers (ELPs) reversibly coacervate above a critical temperature, showing a visible transition phase that can be explored as a purification method². In the present work we have constructed and produced a new smart-thermal responsive ELP based on the (VPAVG) 220 sequence and a new set of copolymers (SilkElastinLike Polymers – SELPs) consisting of flexible ELP blocks and crystalline SilkLike blocks (GAGAGS) in different proportions³. By combining the silk and elastin-like blocks in various ratios we produced a variety of biomaterials with different properties, such as viscosity (dependent on number of elastin-blocks) and gelation time (dependent on number of silk-blocks). The stability of these SELPs in combination with their biocompatibility and unique mechanical properties provides the basis to exploit them for biomedical applications.

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