

Recombinant elastin-like protein polymer for tissue engineering

Recombinant amphiphilic tetrablock protein polymer

Product Number: TP40601

Lot. No. (See product label)

Mol. Weight: Monodisperse recombinant protein containing 1107 amino acids and having a molecular weight of 93.1 kDa by MALDI-TOF mass spectrometry.

p.I.: 2.9

Purity: >97% by SDS-PAGE gel

Additional characterization: FT-IR, ¹H-NMR (DMSO)

Sequence:

MESLLP-[(VPGVG VPGVG VPGEG VPGVG VPGVG)₁₀-(VGIPG)₆₀]₂-V

Description: The monomer unit contains two different amphiphilic functional blocks in order to achieve an adequate balance of biocompatibility, mechanical and thermal responses. The first block (E) confers the pH-responsiveness and the second block (I) is thermo-responsive.

Source: Microbial production.

Formulation: Sterile lyophilized form (white foam) from a 0.2 µm-filtered solution using deionized ultrapure water.

Preparation Instructions: Lyophilized protein can be reconstituted in water or aqueous buffer solutions up a concentration of 200 mg/mL at cold temperature (4 °C). Other organic solvents: DMF, DMSO, TFE (100 mg/mL).

Storage and Stability: This lyophilized preparation is stable at room temperature, long storage it should be kept at -20 °C. Reconstituted material should be stored in working aliquots at 4 °C for 2 weeks.

Additional information for water-based solutions:

Stimuli-responsiveness and T_t : These protein polymers undergo a phase transition

in response to changes in the temperature. Below the so-called inverse transition temperature (ITT) the uncrosslinked polymer chains are soluble in water, however, above the transition temperature (T_t) the polymer chains form nano- and microaggregates which segregate from the solution.

This reversible process is monitored by DSC showing a T_t (°C)-dependent concentration:

CONCENTRATION (mg/mL) pH 7	DEIONIZED ULTRAPURE WATER	PBS
50	18-19	15-16
150	11-12	8-9

Deionized ultrapure water, pH 3.5 (50 mg/mL): 16°C

Thermo-gelling properties: This protein polymer undergoes reversible sol-gel transition (>100 mg/mL) under physiological conditions affording to biocompatible elastic gels in less than 5 minutes (elasticity and time-dependent concentration).

References:

Soft Matter 2010, **6**, 1121 - 1124.

Product use limitation: This product is exclusively for *research purposes and in vitro use only*. The product was not tested for administration to humans or animals.

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