# Recombinant elastin-like protein polymer for tissue engineering

## Recombinant REDV-containing protein polymer

**Product Number:** TP20109

**Lot. No.** (See product label)

**Mol. Weight:** Monodisperse recombinant protein containing 877 amino acids and having a molecular weight of 80.9 kDa by MALDI-TOF mass spectrometry.

**p.I.:** 5.4

**Purity:** >97% by SDS-PAGE gel

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

**Sequence:**

MESLLP-
[VPGIGVPGIGVPG**K**GVPGIGVPGIGEEIQIGHIP
**REDV**DYHLYPVPGIGVPGIGVPG**K**GVPGIGVPG
IGVG**VAPGVG**VAPGVGVAPG]$_{10}$-V

**Description:** The monomer unit contains three different functional blocks in order to achieve an adequate balance of mechanical and bioactive response. The VPGIG sequence confers the mechanical properties (similar to the natural elastin), the biocompatibility and the stimuli-responsive nature. The second building block VPGKG is a modification of the first, containing lysine, so that the lysine ε-amino groups can be used for crosslinking purposes and other chemical modifications. The next block contains periodically spaced fibronectin CS5 domains enclosing the cell attachment sequence REDV, which has been found to be specific for endothelial cells. Finally, a target hexapeptide sequence (VAPGVG) for elastase-proteolitic action with bioactive properties (modulation of proliferation and migration among others) has been introduced.

**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 300 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 $T_t$ (50mg/mL):

Deionized ultrapure water, pH 7.2: 31°C

PBS, pH 7.2: 29°C

**References:**

*J. Mater. Sci. Mater. Med.* 2004, **15**, 479-484
*Biomaterials* 2011, **32**, 5756-5764.
*Tissue Engineering Part A* 2009, **15**, 887-899.
*Biomacromolecules* 2009, **10**, 3015-3022.

**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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