Post-modifications of recombinant elastin-like polypeptides

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Abstract

While structure-property relationships are tricky to establish with polydisperse natural or synthetic polymers, such studies are more reliable with genetically-engineered recombinant polymers that are strictly monodisperse in terms of chain length and monomer sequence. Protein engineering however implies long and tedious molecular cloning steps that often prevent the systematic study of large series of recombinant polymers. Applying methods from bioconjugation chemistry to recombinant polymer scaffolds shall allow accessing a large variety of precision polymer structures in reasonable time and costs. In this context, our group explores orthogonal ligation strategies to chemoselectively modify the guest residue (Xaa) of elastin-like polypeptides' repeat units (Val-Pro-Gly-Xaa-Gly) in order to introduce various chemical groups, modify the solubility/hydrophobicity of the ELP backbones and thereby easily tune their LCST. Such method can also be used to conjugate biologically relevant motifs to confer specific bioactive properties to inert ELP scaffolds.

Keywords: Recombinant polypeptides, orthogonal chemistry, elastin, thermo, responsive materials

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