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FROM DYNAMIC STRUCTURES TO FUNCTIONAL MATERIALS

Building membranes from elastin-like polypeptides

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Elastin-like polypeptides (ELPs) are genetically engineered biopolymers characterized by the repetitive pentapeptide motif VPGXG. They can be responsive to temperature, ionic strength, and pH. Due to their sequence-defined structure and options for modifications and conjugations, ELPs are highly attractive biomaterials for biomedical and biophysical applications, particularly in drug delivery and biomimetic membrane systems. Amphiphilic ELPs can self-assemble into supramolecular structures, such as nanoparticles, micelles, and vesicles, which act as protein-based analogues of liposomes with added advantages including genetic tunability and responsiveness to stimuli[1]. However, the mechanisms of ELP self-assembly and membrane analog processes remain incompletely understood. The recombinant production of ELPs and the optimization of expression and purification protocols represent key prerequisites for any systematic biophysical study. We investigate the ELP assemblies using monolayer methods and fluorescence-based techniques.

(1) A. Schreiber, et al., *Small* **15**,30 (2019)