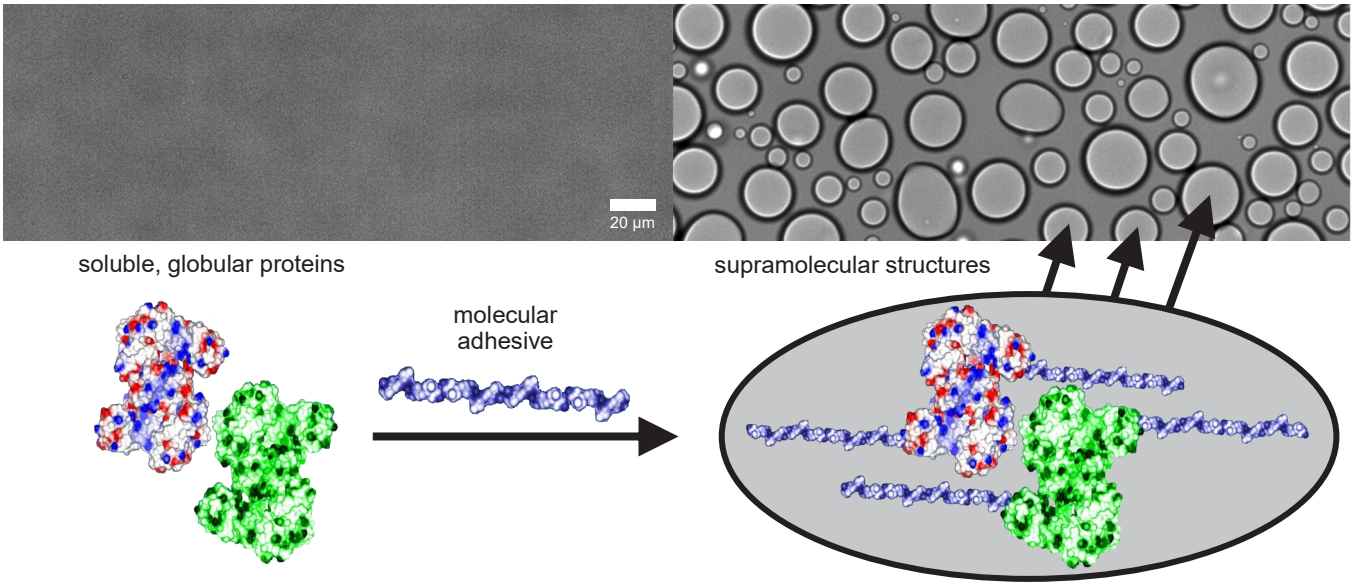
ETH zürich

Licensing Opportunity

Multifunctional protein-based materials and micro-reactors for biotechnological applications



Summary

Biologically inspired molecular adhesives assemble multiple proteins in one supramolecular structure, opening a new class of enhanced enzymes, pharmaceuticals or biosensors.

Background

It is a severe need to combine multiple functionalities within the same protein-based material for applications in enzyme technology, biosensors and drug delivery. Current approaches rely on the post-functionalization of pre-formed scaffolds, which come with the risk of activity loss due to material loss or modifications of the pristine protein structure.

Invention

The molecular adhesive is a protein sequence enriched in specific aminoacids. Conjugation of these molecular adhesives to globular proteins with different functionalities induces the assembly into sumpramolecular structures (see figure above). Depending on the molecular adhesives, these structures range from liquid micro-compartments to solid particles. The principle was tested in the laboratory for innovative enzymes.

Features & Benefits

- Assembly of multiple proteins into desired supramolecular structures
- Both reversible and irreversible structures, from liquid to gel to solid
- Stimulus responsiveness

Fields of Application

- Enzymes, food, pharmaceuticals
- Formulation and delivery of proteins at high concentrations

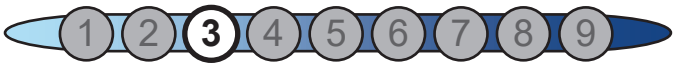
Patent Status

- Patent pending

Publication

- L. Faltova, A.M. Küffner, M.T. Hondele, K. Weis, P. Arosio "Controlled self-assembly of globular proteins using low complexity domains as molecular adhesives", ACS Nano (2018), DOI: 10.1021/acsnano.8b04304

Technology Readiness Level



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