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Self-assembled nano-reactors via bacteriophage engineering (ROBOPHAGE)

Initiative: Integration molekularer Komponenten in funktionale makroskopische Systeme (beendet, nur noch

Fortsetzungsanträge)

Bewilligung: 25.06.2017

Laufzeit: 3 Jahre

The project will utilize phages (bacterial viruses) to construct new self-assembling nano-architectures and novel enzyme-driven systems. The unique structure of the phages - molecular addressable biological nanowires - will allow to position enzyme-catalysts with sub-micron precision on the proteinaceous phage template. In addition genetic engineering and versatile linkers will be used to couple the phages to micro- and nanoparticles and to build novel network architectures with the phages. This permits truly macroscopic applications of these chemically active systems and allows to develop phage-reactors and phage-robots. The approach aims at the development of high performance phage-systems for synthesis, detection, and locomotion. In particular, fully self-assembled chemically active structures can be obtained, including the first actively swimming viruses that permit the transport of particles through biological media such as mucus, where otherwise no particulate transport would be possible.

Projektbeteiligte

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Chemotaxis of Active Janus Nanoparticles

Genetically modified M13 bacteriophage nanonets for enzyme catalysis and recovery.