

Metal controlled catalytic DNA and DNA-protein nanomachines

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

Fortsetzungsanträge)

Bewilligung: 08.07.2010

Laufzeit: 3 Jahre

The proposal aims at the construction of complex, catalytic 1D and 2D DNA nanomachines, controlled by the selective coordination of metal ions. The metal ions will be bound either using canonical bases in a mismatch situation like T:T or C:C, or they will be incorporated with the help of specifically designed and synthesized ligandosides, which are able to bind particularly transition metal ions tightly. The metal ions will function in the DNA structures 1) as centers for catalytic activity, 2) in array format as efficient charge transfer relay systems through the DNA structure, or 3) the empty metal-ion binding sites may serve as an actuator that transfers the information when a metal ion is bound to a catalytic DNA/RNA or protein substructure. The DNA or DNA-protein (hybrid) structures will be assembled to functional 2D and 3D arrays in solution, on surfaces or electrodes. The goal of the research project is to obtain complex autonomous catalytic nanomachines, tightly controlled by outside stimuli.

Projektbeteiligte

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