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DNA Origami-Based Protein Manipulation Systems : From structural biology to mechanical regulation

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The introduction of DNA origami, which uses many staple strands to fold one long scaffold strand into a rationally designed nanostructure has dramatically improved the complexity and scalability of DNA nanostructures with unprecedented capabilities. Our goal is to explore the bottom-up structural DNA origami nanotechnology to build artificial molecular systems and machines sufficiently sophisticated to recapitulate and decipher fundamental aspects of biology. In this presentation, I will first, discuss the DNA origami method. Second, I will introduce the V-shape design as a modular imaging scaffold for single-particle electron microscopy (EM). I will also present our latest progress in constructing a nano-machine that can be programmed to actuate autonomously as a “robot” for the mechanical activation of membrane proteins.

Session

Molecular interactions at the membrane surface

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