

3D self-assembly using DNA as programmable molecules.

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Bottom-up structural DNA nanotechnology, specifically DNA origami, has emerged as a technique with unprecedented capabilities for the self-assembly of rationally designed nanostructures. Our goal, is to build artificial molecular systems and machines sufficiently sophisticated to recapitulate and decipher fundamental aspects of biology. In my presentation, I will, first, discuss how we can build fully addressable DNA nanostructures up to 1 gigadalton from modular DNA components. Second, I will present the conception of modular imaging scaffold for single-particle cryo electron microscopy and then I will present some of our latest progress towards the construction of devices with greater complexity, like a molecular nano-machine for mechanical activation of membrane proteins.