

Programming Nano-component Structures

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The ability to organize nano-components into the desired organizations is one of the major limitations for creating material systems from nanoparticles. Our efforts are focused on establishing a broadly applicable DNA-based platform to address this challenge. Our research explores novel concepts for creating targeted static and dynamic nano-architectures by bridging DNA-encoded nano-objects with structural plasticity of DNA macromolecular constructs. Through establishing effective assembly strategies, revealing the principles governing these DNA-programmable systems and exploring the effects of DNA shells of particles, we develop methods for creation of well-defined three-dimensional lattices, two-dimensional arrays and finite-sized cluster architectures from the nano-components of different kinds. Our recent advances will be discussed.

