

Molecular Programming with DNA/RNA

Peng Yin

Wyss Institute for Biologically Inspired Engineering, Harvard University

py@hms.harvard.edu

I'll discuss how to use DNA/RNA to construct nanostructures and develop applications. We have invented a general framework to program DNA/RNA strands to self-assemble into structures with user-specified geometry or dynamics. By interfacing these nanostructures with other functional molecules, we have introduced digital programmability into diverse application areas, e.g. fabrication of inorganic nanoparticles with arbitrary prescribed shapes for future nanoelectronics, robust DNA probes with near optimal binding specificity for molecular diagnosis, RNA-based genetically encodable translation regulators with unprecedented dynamic range and orthogonality for programming biology, and a highly multiplexed and ultra-high resolution optical imaging method for digital pathology. For more details of our work, see <http://molecular.systems>.