Scientific Achievement
The new approach offers a rational assembly of nano-objects into ordered 3D arrays.

Significance and Impact
Self-assembly is an attractive method for building nano-systems for catalytic, optical and energy materials, but creating the targeted 3D ordered nanomaterials is challenging. The developed platform offers assembly of nanomaterials via “material voxels.”

Research Details
- Assembled & integrated 3D DNA frames with nanoparticles and proteins to form material voxels.
- Computationally rationalized & experimentally assembled different types of 3D ordered lattices.
- Revealed the relationship between material voxel designs and formed structures through in situ x-ray scattering at the CHX and CMS beamlines at NSLS-II & ex situ electron microscopy at the CFN.
- Created novel optical and catalytic nanomaterials.