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The fabrication of DNA nanostructures and their applications in bionanotechnology

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Deoxyribonucleic acid (DNA), as you may very well know, is the carrier of generic information in living cells, which can replicate itself through Watson-Crick base pairing. However, over the past three decades, researchers in the emerging field of DNA nanotechnology have been using the DNA as structural nanomaterials, based on its unique molecular recognition properties and structural features, to build addressable artificial nanostructures in one, two and three dimensions. These self-assembled nanostructures have been used to precisely organize functional components into deliberately designed patterns which have a wide application potential in material science, biomedical, electronic and environmental fields. The development of DNA nanotechnology and its potential application will be covered. Then this talk will discuss the design and construction of several DNA nanostructures, including self-assembly of DNA six-helix nanotubes from two half-tube components; Using DNA origami template to organize semiconducting quantum dots (QDs) and gold nanoparticles (AuNPs) and discussing the methods to integrate “top-down” nanofabrication technique with “bottom-up” self-assembly.

Biography

Risheng Wang has completed her PhD in 2010 from New York University. She then joined as Postdoctoral research associate, the Department of Chemistry and Applied Physics and Applied Mathematics (APAM) at Columbia University. After which she became an Assistant Professor at Chemistry department of Missouri University of Science and Technology. She has published a series of papers in reputed journals.

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