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Engineering DNA nanostructures: Application from drug delivery to plasmonic metamolecules

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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 paring. However, over the past four 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. This talk will discuss the design and construction of several DNA nanostructures, which have been employed as label-free drug delivery carrier for breast cancer therapy. In addition, self-assembly of heterogeneously shaped nanoparticles into plasmonic metamolecules on DNA origami scaffold will be covered too. The combination of biomaterials and inorganic nanomaterials provides a promising pathway for manufacturing more complex and advanced materials for nanotechnology applications.

Biography

Risheng Wang has received her PhD in Chemistry under the supervision of Professor Nadrian C Seeman from New York University in 2010. She then joined the Department of Chemistry at Columbia University as a Postdoctoral Research Associate, after which she became Associate Research Scientist at Columbia. She joins Missouri University of Science and Technology as an Assistant Professor in the Department of Chemistry in the fall of 2014. Her research focuses on the development of novel techniques for organizing functional nanomaterials for optoelectronic and biomedical applications. Her work has been published in several top peer-reviewed journals and has been serving as an Editorial Board Member of repute.

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