Special Seminar

Department of Chemistry

Monday, April 15, 2019
Time 14:00
Bldg. 51 Room 015

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(Candidate)

Synthetic Nucleic Acid Topology and Colloidal Nanoparticles for Biological and Plasmonic Applications

Research Abstract

The iconic double helical structure of DNA has excited the imagination of both scientists and non-scientists for more than six decades. In recent times, the programmable nature of DNA has redefined its use as a powerful building material for the construction of precisely defined 1D, 2D, and 3D nanoscale assemblies. The term “DNA structure” combines the chemical, stereochemical and biological advantages into one focus that can be applied to a broad range of scientific fields. The Weizmann group aims to demonstrate novel approaches that take nucleic acids philosophy to a new level, with the potential application in chemistry, biology, material science, and nanomedicine studies. We focus on the fundamental design, functions, and applications of highly programmable nucleic acids nanostructures. Our main research objective is the development of novel strategies and approaches providing versatile tools to form composite, nano-scaled, precisely-controlled nanostructures and ultra-sensitive DNA machinery. The following research fields will be represented:

(a) Design and applications of novel synthetic molecular topologies from programmable nucleic acids and their biological consequences for enzyme mechanisms, drug discovery, and drug delivery. (b) Synthesis of programmable assemblies of colloidal nanoparticles with specific and anisotropic bonding directionality for applications in self-assembly, plasmonics, and photothermal energy conversion for ultrafast nucleic acid amplification point-of-care diagnostic.