

BIOENGINEERING SEMINAR

FALL 2021

Synthetic DNA Nanostructures as Platforms for Facile Nanoparticle Organization

Abstract

The field of DNA nanotechnology has enabled scientists to realize the ability to “build” objects at the nanoscale. With the help of a growing repository of DNA self-assembling tools and strategies, it is possible to create two- and three-dimensional structures ranging from a few nanometers to micron-scale in size. The cumulative properties of DNA, particularly its well-studied structural and physical behavior in response to varied conditions, its chemical and biological compatibility with a host of organic and inorganic nanoparticles, and the predictable base pairing principles have enabled DNA nanotechnology to be widely adopted in many scientific disciplines, namely, single-molecular studies, photonics, plasmonics, synthetic biology, and healthcare. In this work, I will share our work on building DNA-based platforms for the organization of inorganic and organic nanoparticles with nanometer precision. We explore the extent to which DNA platforms can control the relative positioning and orientation of these nanoparticles to augment their photophysical abilities. Finally, I will share our recent work into understanding the fate of DNA nanostructures when introduced into mammalian cell cytosol as it plays a critical role in developing biocompatible delivery systems

Biography

Divita Mathur received her Ph.D. in bioinformatics and computational biology from Iowa State University in May 2016 under Prof. Eric Henderson and Prof. Jack Lutz. She is currently a postdoctoral fellow at the U.S. Naval Research Laboratory through the College of Science at George Mason University, where her work focuses on the design and engineering of dynamic self-assembling DNA nanosystems for interfacing with cellular signals and templated arrangement of inorganic nanoparticles. She is the recipient of the NIH K99/R00 Career Development Award, with the support of which she will investigate the fate of DNA nanostructures inside the cell cytosol.



Divita Mathur, PhD

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**Thursday, October 7
12:00-1:00 pm**

Join Zoom Meeting:

<https://gmu.zoom.us/j/91001788853?pwd=enZXRXFneG1zdk5NN1VM5WtnQlJMUT09>

Meeting ID: 910 0178 8853

Passcode: 229574