

Synthetic DNA-based devices, switches and genes for clinical applications

Francesco Ricci¹

¹University of Rome Tor Vergata, Rome, Italy.

francesco.ricci@uniroma2.it

DNA nanotechnology uses synthetic DNA (or nucleic acids) as a versatile material to rationally engineer tools and molecular devices that can find a multitude of different applications (e.g., in-vivo and in-vitro diagnostics, drug delivery, genetic circuits etc.).

During this presentation I will introduce the field of DNA nanotechnology and I will show how to exploit the “designability” of DNA to fabricate DNA-based nanoswitches, nanodevices and synthetic genes that are specifically designed to respond to different targets and generate a measurable output or release a molecular cargo.

I will demonstrate how to characterize and recreate in-vitro several mechanisms to control the response of such DNA-based systems and how to regulate their activity with different chemical and environmental stimuli including pH, antibodies, enzymes, small molecules and redox inputs.