DNA nanodevices for cell specific cargo delivery in live organisms

Due to its nanoscale dimensions and ability to self-assemble via specific base pairing, DNA is rapidly taking on a new aspect where it is finding use as a construction element for architecture on the nanoscale. Structural DNA nanotechnology has yielded architectures of exquisite complexity and functionality in vitro. However, till 2009, the functionality of such synthetic DNA-based devices in living organisms remained elusive. Work from my group the last few years has bridged this gap where, we have chosen architecturally simple, DNA-based molecular devices and shown their functionality in complex living environments. I will describe our recent work describing the design and application of a cell targetable icosahedral DNA nanocapsule to illustrate the potential of DNA based molecular devices as unique tools with which to interrogate living systems.

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