VIDEO ARTICLE

Vid. Proc. Adv. Mater., Volume 3, Article ID 2208301 **(2022)**

Programming DNA Logic Devices

Debopriya Bose

Department of Biophysics, Bose Institute, Kolkata, West Bengal 700054, India

Corresponding author: E-mail: debopriyabose94@gmail.com
DOI: 10.5185/vpoam.2022.08301

Abstract

Nucleic acids have garnered increased attention in the last decade as programmable devices for the design of novel logic devices amenable to both computation and biological applications. In particular, the firmly established hybridization schemes of DNA along with their ease of synthesis and stability have encouraged the scientific community to explore the potential of these compounds beyond their cellular functions. DNA has naturally evolved to store millions of gigabytes of data and harnessing this power may enable the design of superior computational devices with extensive complexity. Here we will discuss the applications of DNA in the design of logic devices. We will also discuss the applications of proteins, nanoparticles and various photosensitive and electroactive compounds in designing environment sensitive DNA logic circuits. Finally, we will finish with some specific applications of these systems in living systems. We will also bring light to the remaining hurdles and future perspectives of this novel technology. We hope that our work brings more biologists into this field and encourage the development of novel computational DNA devices.

Biography of Presenting Author

Debopriya Bose is currently pursuing her Ph.D. in the laboratory of Dr. Subhrangsu Chatterjee, Associate Professor, Department of Biophysics, Bose Institute, Calcutta, India. She received her M.Sc. degree from Bose Institute, University of Calcutta, India (2018) with a specialization in Molecular and Cellular Biology. Her M.Sc. dissertation deals with cancer immunity. She is highly specialized in the field of tetraplex biology and her research focuses on non-canonical structures in DNA and the role of proteins in maintaining these structures.

Citation of Video Article

Vid. Proc. Adv. Mater., Volume 3, Article ID 2208301 **(2022)**

Full Video Article www.proceedings.iaamonline.org/article/vpoam-2208301