"Towards DNA- and Protein-Based Nanoelectronics?"

Hezy Cohen[1], Claude Nogues[1,2], Daniela Ullien[1], Tomer Sapir[1], Errez Shapir[1], Nataly Borovok[3], Tatiana Mototsky[3], Ron Naaman[2], Rosa Di Felice[4], Juyeon Yi[5], Alexander Kotlyar[3], and Danny Porath[1*]

1- The Hebrew University of Jerusalem, Isral; 2- The Weizmann Institute, Rehovot, Israel; 3-Tel Aviv University, Israel; 4-INFM-Modena, Italy; 5-Pusan University, Korea

Abstract. DNA is considered as one of the attractive candidates for molecular electronics and an excellent model system to stdy conduction in one-dimensional single polymers. It was studied in many ways including: electrical transport, atomic force microscopy (AFM) and scanning tunneling microscopy (STM). The results of various measurements of charge transport in DNA seem inconsistent. A deeper look into the experiments can offer a general understanding of the reports and ways to optimize the conductivity in DNA.

As time allows, I will show a selection of the following topics from our research: (i) Electrical measurements of relatively high current (200 nA@2 V) in short (10 nm long) DNA molecules supported by multileveled evidence. (ii) Measurements of the electronic structure of homogeneous DNA molecules acquired by scanning tunneling spectroscopy (STS). (iii) Clear polarizability of G4-DNA, a promising DNA derivative.

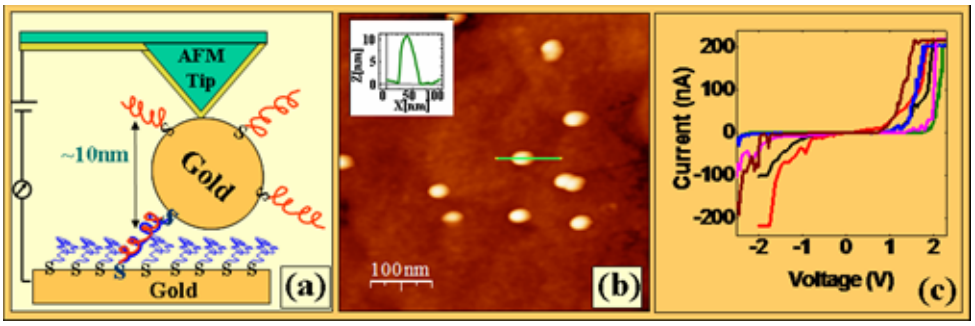

FIGURE 1. Schematic of the experiment (a) and a topography image of gold nanoparticles connected through double-stranded DNA to an underlying gold surface surrounded by a single-stranded DNA monolayer (b). A collection of current-voltage curves measured on different molecules from various samples (c).

* *Corresponding author: porath@chem.ch.huji.ac.il*

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