



SEMINAIRE SPAM / LFP



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Le jeudi 1^{er} Octobre 2009 à 11h00
Bâtiment 522 - Salle 138

«*Synthesis and properties of DNA-based nanowires*»

The DNA molecule has attracted extensive interest over the past decade as a possible candidate for nanoelectronics. The self-assembling properties of DNA, its accurate synthesis, and specific interaction with proteins, guided by recognition are extremely useful for implementing self-assembly in molecular circuits. One of the main challenges with such molecules, however, is the control of their electrical conductivity. The current viewpoint is that native double stranded DNA is an insulator (poor semiconductor) rather than conductor. This prompted us to develop two types of novel continuous G4-nanowires, namely the wires composed of a single long (thousands of bases) self-folded G-strand [1,2] and the wires composed of four parallel poly(G) strands clustered together by avidin [3]. The 4G-wires comprise a large number of stacked guanine tetrads providing better conditions for π overlap compared to base-pairs of the canonical double stranded DNA. A high content of guanines, which have the lowest ionization potential among DNA bases, also makes charge migration through the DNA highly probable. This strongly indicates that the conductivity of G4-DNA is potentially better than that of dsDNA, making G4-DNA a valid alternative to dsDNA to develop DNA-based nano-electronics.

1. Kotlyar A.B., Borovok N., Molotsky T., Cohen H., Shapir E., Porath D. Long Monomolecular G4-DNA Nanowires. 2005 *Adv. Materials* 17, 1901-1905
2. Borovok N., Molotsky T., Ghabboun J., Porath D., Kotlyar A. Efficient procedure of preparation and properties of long uniform G4-DNA nanowires. 2008 *Anal Biochem.* 374, 71-78.
3. Borovok N., Iram N., Zikich D., Ghabboun J., Livshits G. Porath D., Kotlyar A. Assembling of G-strands into novel tetra-molecular parallel G4-DNA nanostructures using avidin-biotin recognition. 2008 *Nucl. Acid Res.* 36, 5050-5060

Formalités d'entrée :

Visiteur U.E. : Se faire connaître au moins 48 heures à l'avance pour l'établissement de votre autorisation d'entrée sur le Centre de Saclay.

Visiteur hors U.E. : Se faire connaître au moins 4 jours à l'avance pour les formalités d'entrée et se faire accompagner par un agent CEA.

Sans autorisation, vous ne pourrez entrer sur le Centre de Saclay. Tél. : 33.1.69.08.30.95 - Fax : 33. 1.69.08.76.39 - email : caroline.lebe@cea.fr ou veronique.gereczy@cea.fr

Dans TOUS LES CAS, se munir d'une pièce d'identité (passeport et carte d'identité - pas de permis de conduire)