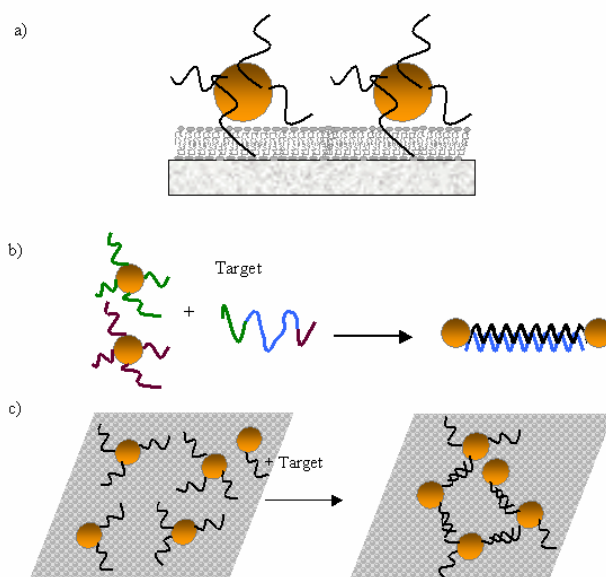


## Label Free Bidimensional Colorimetric Sensor For The Detection Of DNA

A. Charrier, N. Candoni, N. Liachenko, F. Thibaudau

CRMCN-CNRS, Campus de Luminy, case 913, 13288 Marseille Cedex 09, France

A major challenge in the area of DNA detection and identification is the development of methods that do not rely on the labeling of targets DNA. We present here a new detection method which combines the aggregation of nanoparticles and their adsorption on a supported surface. It is based on the 2D aggregation of DNA modified gold nanoparticles probes on a supported fluid layer. The great originality of this sensor arises from the transduction method used to determine the presence of hybridized DNA. The aggregation detection is colorimetric, but in contrast with the previously described method by Mirkin and al.<sup>1</sup>, the color change is based on the selective desorption of the nanoparticles from the substrate depending on their 2D aggregation. we will describe this new detection method and we will show that its high specificity can be used to detect mismatches or DNA damages.



a) Schematic of the detection device. The system is constituted of three layers : the organic or inorganic substrate (glass, polymer,  $\text{SiO}_2$ ,  $\text{Si}_2\text{N}_3$ , Mica), the lipid layer and the oligonucleotides modified gold nanoparticles (NPs). b) Principle of NPs assembling through DNA hybridization. Two sets of NPs are prepared with different single stranded probes oligonucleotides. Hybridization of complementary target DNA with both probes oligonucleotides in leads to the NPs aggregation. c) A top view schematic of the system before and after hybridization.

<sup>1</sup> Elghanian, R., Storhoff, J.J., Mucic, R.C., Letsinger, R.L., Mirkin, C.A., Science 277, 1078 (1997)