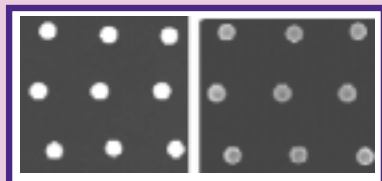


# Towards high performance genomic and proteomic analyses

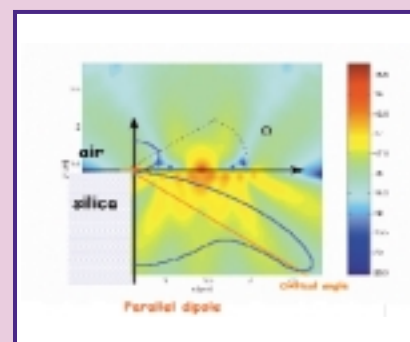
DNA chip technology has brought a revolution to molecular biology experimentation. These new tools are made of a few cm<sup>2</sup> of glass, silicon or polymeric membrane on which are grafted thousands of DNA fragments. The technology holds great promise as thousands of genes may be analyzed simultaneously in a single biological sample. To improve the technology and bring it to an industrial success for medical diagnostics and environment monitoring, it remains a challenge to increase sensitivity and lower costs. By relying on cutting edge technologies available at the CEA, we aim to do this through various R&D projects, in particular by **enhancing fluorescent detection** and by implementing **DNA chips in a capillary format**.

## Substrates for Enhanced Fluorescence

Thanks to mathematical simulations of fluorescence emission in the proximity of solid surfaces, scientists from the CEA have proposed innovative solutions in DNA chip optical surfacing. These optic films (Bragg type mirrors) direct the photons away from the substrate towards the detector and thus enhance the fluorescent signals on the chip. Experimental validations confirmed the efficiency of the theoretical model.



component with reinforcement of fluorescence      Standard glass substrate

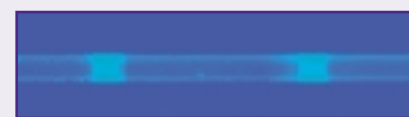


Partners : Thalès, Apibio

## Capillary arrays

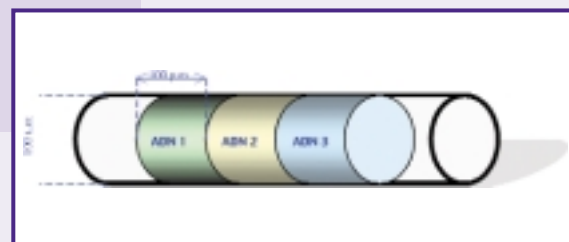
The array format is a succession of hundreds of biological molecules: DNA, peptides or proteins grafted on the inside of a hair-sized glass tube. Each element is confined to a cylindrical section. In this configuration, hundredths of a microliter samples can be analyzed.

The capillary can be connected to a LabOnChip module, an electrophoresis unit or a mass spectrometer for further analysis.



Capillary array

Partner : AbAg.



## Applications

- High Sensitivity Genomic and Proteomic studies of small samples
- Diagnostics
- LabOnChip modules

Contacts :

Life Sciences Division : F. Chatelain (françois.chatelain@cea.fr)

Leti : P. Puget (pierre.puget@cea.fr)