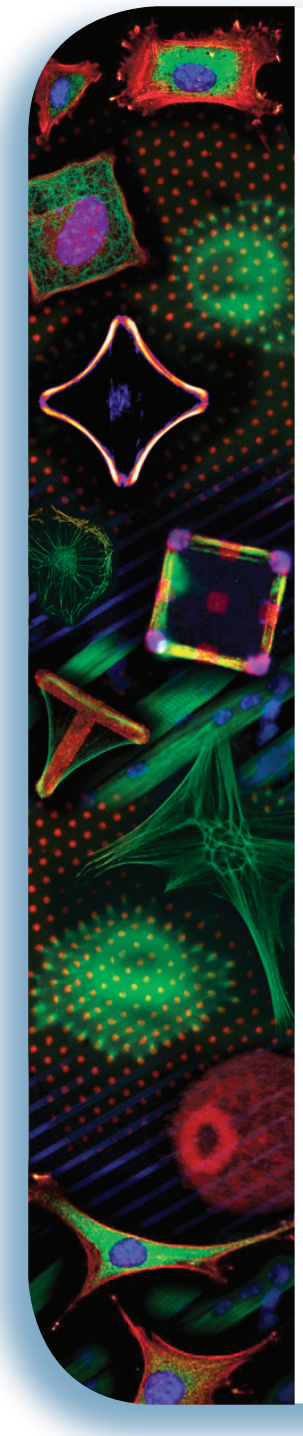

As part of our "Nano & Micro-envirmonments for Cell Biology" seminar series, we are delighted to invite you to attend this seminar to be given in english by :

Karine ANSELME

Institut de Science des Matériaux de Mulhouse

Tuesday 17 Décembre 2013
2pm

Nuclear deformation of cancerous cells on micropillared surfaces: interest for understanding mechanotransduction of invasive metastatic cells

Amphithéâtre M001
Grenoble INP - Ecole Phelma MINATEC
3 parvis Louis Néel - 38000 Grenoble

nano SCIENCES FONDATION

Nuclear deformation of cancerous cells on micropillared surfaces: interest for understanding mechanotransduction of invasive metastatic cells

A great understanding of interactions between cells and biomaterials are necessary to develop implants or bioactive surfaces. Stiffness, chemistry and topography have been largely described to be key factors controlling cells behavior on materials. Several studies have shown that normal outer cells shape can be modified with specific chemistry, stiffness and topography[1].

We have previously demonstrated that we can extend these altered shapes to the interior of cells. Indeed, by using micropillared substrates we have shown that strong deformations of cancerous cell bodies can be obtained and that these alterations can also affect the nucleus shape[2]. We have currently described that such deformations are tightly cell type dependant and especially of their cytoskeleton organization[3]. These strong deformations of cells and of their organelles which don't affect viability and proliferation draw an analogy with the metastatic process. That is why the understanding of cells mechanics and of the related inner forces in this model is essential. As the deformability of cells is strongly connected with their cytoskeleton dynamics, we have first decided to evaluate the involvement of each cytoskeleton component thanks to inhibitors (chemicals and siRNA). We have then tried to identify an eventual role of the LINC complex in nucleus deformation. Deformations, migrations and mitosis in dynamics have also been observed on these micropillared surfaces. The deformability of cancerous cells on pillars has been compared to their capacity to transmigrate in Boyden chambers that are classical tests to evaluate invasion potential of cancerous cells.

[1]. Thery M., JCS (2010),123:4201-4213
[2]. Davidson P. et al., Adv. Mater. (2009),21:3586-3590
[3]. Badique F. et al., Biomaterials (2013), 34(12), 2991-3001.

nano SCIENCES FONDATION