



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

Paolo A. NETTI

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Centre for Advanced Biomaterials for Health Care
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Tuesday 4 March 2014
2pm



Engineering biological tissue in vitro by cell instructive materials

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

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Engineering biological tissue in vitro by cell instructive materials

Interaction between cell and tissues occurs through a variety of biochemical and biophysical signals, including matricellular, topographical and mechanical cues. Deciphering this language, i.e., the mechanisms by which cells recognize these signals at the interface, may help in engineering novel materials able to control and direct deterministically specific cellular functions. However, even if a large repertoire of material properties have been reported to affect the cell-material crosstalk, the proper presentation to the cell surface to elicit specific cell response is still largely unknown.

Here the basic signals that control the dynamics of cell-material interface will be presented and discussed in a unifying frame of material- cytoskeleton interplay. Specific evidences and examples of simple materials generated cellular instruction will be presented along with future perspective of engineering more complex cell instructive materials. For instance, materials engineered to guide and control the process of tissue development in vitro will be presented.

Paolo A. Netti received his PhD in Chemical Engineering (on: Molecular transport in polymer gels) in 1994 from the University of Naples “Federico II”. He spent several years at the IRC in Biomedical Materials at the University of London (UK) and was then appointed a post-doctoral fellow at Harvard University, (MA, USA), where he worked with Rakesh K. Jain, one of the most famous bioengineers in the world. During his 4 years of postdoctoral studies he complemented his engineering and polymer physics background with the foundations of tissue physiology and cell biology.

Paolo Netti has been pioneering the concept of integrating molecular sequestration and release mechanisms in the design of novel biomaterial scaffolds able to control and guide the complex process of tissue growth at single cell dimension. After his return in Naples, Paolo Netti implemented his deep knowledge on the function of extracellular matrix in controlling the local cellular environment by sequestration and release of bioactive moieties to design novel biomaterials able to provide a controlled molecular microenvironment for cell function. He proposed a novel class of bioactive materials, namely cell instructive materials, that provide a tight spatial and temporal control of the cellular microenvironment and offer the potentiality to control cell and tissue fate.

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