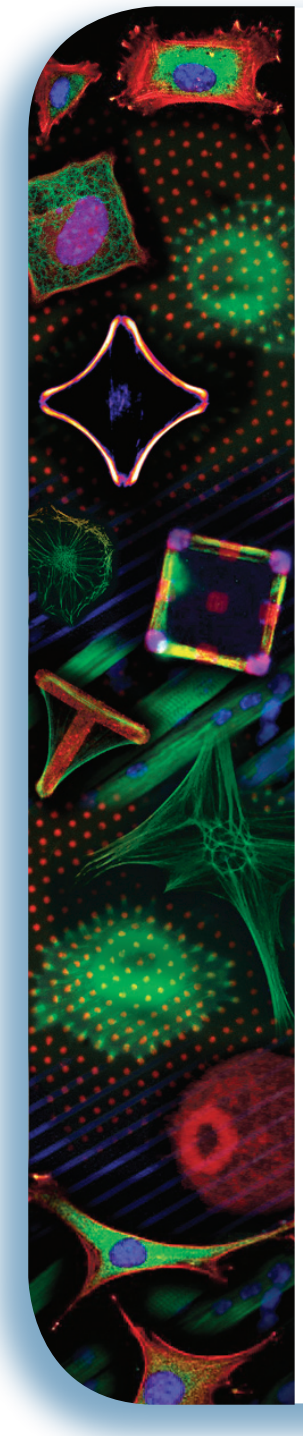

As part of our "Nano & Micro-envirmonments for Cell Biology" seminar series, we are delighted to invite you to attend this seminar to be given in english by :

Prof. Dr. Petra SCHWILLE

Department of Cellular and Molecular Biophysics
Max Planck Institute of Biochemistry, Martinsried

Monday 16 September 2013
2pm

Synthetic Biology of minimal cellular systems

Lecture room - 3rd floor
Building A - CNRS Tower
25 rue des martyrs - 38000 GRENOBLE

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Enabling technology for label-free detection, separation, patterning and in vitro culture of cells

In recent years, biophysics has accumulated an impressive selection of novel techniques to analyze biological systems with ultimate sensitivity and precision, down to the single molecule level. However, a strictly quantitative application of most of these techniques in living cells or organisms has so far been extremely challenging and rarely satisfactory, because most biological systems usually comprise so many modules and elements, that a manageable number of relevant control parameters can hardly be defined.

Thus, the strive for identifying minimal biological systems, particularly of subcellular structures or modules, has in the past years been very successful, and crucial in vitro experiments with reduced complexity can nowadays be performed, e.g., on reconstituted cytoskeleton and membrane systems. As a particularly exciting example for the power of minimal systems, self-organization of essential proteins of the bacterial cell division machinery could be shown in a simple assay, consisting of only two protein species, an energy source, and a membrane. In my talk, I will discuss some recent results of our work on membrane-based systems, using single molecule optics and biological reconstitution assays. I will further discuss the perspective of assembling a minimal system to reconstitute cell division.

Recently appointed as Director at the MPI of Biochemistry, Petra SCHWILLE is regarded as one of the internationally leading biophysicists in her field. With her team, they have succeeded in building a minimal system capable of biological self-organization. It consists of two protein types, an artificial membrane and the energy source ATP.
With the help of this model, they could observe that the proteins form patterns and surface waves when supplied with energy. She now aims to use similar approaches in order to analyze and understand processes like cell division as well as the polarization and differentiation of living systems from the bottom up.

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