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Unifying Concepts in Catalysis

UniCat Colloquium

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Lecturer: **Prof. Claudia Steinem**, Institute of Organic and Biomolecular Chemistry, University of Göttingen

Title: **Nanoporous substrates: A platform to generate artificial membrane systems**

Abstract: Porous substrates with pore sizes in the nanometer to micrometer range and aligned cylindrical pore geometry are ideally suited to generate pore-spanning membranes that separate two aqueous compartments. In this talk, I will give an overview about the preparation, characteristics and applicability of these membrane systems. In particular, I will discuss (**A**) the formation of pore spanning membranes on porous alumina substrates resulting in attoliter-sized compartments, (**B**) the detection of ion channel activity, and (**C**) the use of lipid membranes attached to a highly ordered porous silicon substrate to mimic the membrane-skeleton interaction.

A. Porous alumina is a material with nanometer sized aligned cylindrical compartments that are several micrometers deep resulting in an attoliter-sized volume in each pore. Different protocols have been developed to generate pore-spanning lipid bilayers, whose advantages and drawbacks will be discussed.

B. Ion channels can be readily reconstituted into pore-spanning membranes and analyzed using either integral techniques such as impedance spectroscopy or methods that allow the detection of single ion channel events. A few examples will be given to demonstrate the applicability of these membrane systems for ion channel conductance measurements.

C. A highly ordered porous substrate can serve as a mimic for the cytoskeletons' pinning sites and can strongly influence the microscopic phase separation of "raft-like" lipid mixtures. Here, I will show that the phase separation behavior of lipid membranes attached to highly ordered porous silicon is strongly influenced by the underlying substrate. The size of coexisting liquid-ordered (l_o) and liquid-disordered (l_d) domains, visualized by fluorescence microscopy, is strongly affected by the underlying pore size of the silicon substrate and can be controlled by temperature, and the lipid composition.

Date: **Wednesday, 11 May 2011**

Time: **5:15 pm - around 6:45 pm**

Location: **TU Berlin, Institute of Chemistry, Straße des 17. Juni 115, 10623 Berlin Building C, Lecture Hall C 243**

Organiser: **Prof. Peter Hildebrandt (TUB)**

Coffee and tea will be served thirty minutes prior to the lecture start.

Guests are cordially invited to attend!

Prof. Dr. Matthias Driess, Chair of the Cluster of Excellence UniCat