



Research Training Group 1962

Dynamic Interactions at Biological Membranes from Single Molecules to Tissue

Speaker: Prof. Dr. Rainer Böckmann, Computational Biology

Invitation to
RTG 1962 – Guest Talk

Tuesday, 24th of April 2018 at 04.00 p.m. (s.t.)

Dr. habil. PD Rumiana Dimova
(Max Planck Institute of Colloids and Interfaces, Potsdam)

**“Giant vesicles as handy tools for assessing membrane mechanics,
wetting and reshaping”**

Giant vesicles are a fascinating model membrane system, which has been initially established and used as a workbench for studying basic properties of simple lipid bilayers. Nowadays, they are increasingly employed by biophysicists to unravel the mechanisms driving various biological processes occurring at the level of the cell membrane. The success of this enterprise is evidenced by the widening acceptance of giant vesicles as a mimetic system among biologists. Methodologies for assessing the membrane material properties and effects of membrane remodeling factors as deduced from measurements on giant vesicles become increasingly important. In this talk, we will introduce such methods and showcase approaches for measuring mechanical properties such as bending rigidity and spontaneous curvature. The latter is readily generated by asymmetries across the membrane. Two examples will be considered: spontaneous curvature generated by asymmetric distribution of the ganglioside GM1 in the bilayer leaflets, and asymmetric adsorption of poly(ethylene glycol), both of which result in the spontaneous formation of cylindrical or necklace-like lipid nanotubes (see e.g. ACS Nano 10:463, 2016). In addition, the process of wetting of the membrane by crowded aqueous phases will be discussed as a membrane reshaping factor leading to a variety of vesicle shape transformations (Soft Matter 8:6409, 2012; Adv. Mater. Interfaces 4:1600451, 2016). The presented examples will demonstrate that even in the absence of proteins and active processes, the membrane is easily remodeled by simple physicochemical effects.

Guests are welcome!

gez. Prof. Dr. R. Böckmann

→ Venue: Max Planck Institute for the Science of Light, ROOM: A.1.500
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