Contribution ID: **373** Type: **Poster**

X-Ray Investigation of Structure and Kinetics of Photoswitchable Lipid Monolayers

Tuesday 18 September 2018 17:15 (15 minutes)

Having integrated Amphiphilic photoswitchable molocules into phospholipid membranes, we investigate their biologically relevant properties. By studying the interactions in such a model system consisting of switchable biomimetic molecules in lipid membranes here, we study the structure and kinetics of membrane response to the switching process. These in situ experiments not only contribute to the fundamental understanding of membrane dynamics but also will contribute to potential applications for molecular switches such as drug delivery. In order to investigate these properties we study model systems in which amphiphilic photoswitchable molecules are integrated into Langmuir films of phospholipids. We have modified glycolipids to contain an azobenzene photoswitch between the chain and the head group and successfully embedded those in a monolayer of Dipalmitoylphosphatidylcholine (DPPC). This allows us to reversibly change the azobenzene-glycolipid orientation between trans- and cis-conformation by illumination with UV and blue light. We have followed the structural changes in this model membrane and the switching kinetics of the system with Langmuir isotherms and in situ X-ray methods, X-ray reflectivity and grazing incidence diffraction. The membrane structure responds on a time scale of seconds upon UV illumination. Switching from trans to cis conformation results in changes in molecule tilt and spacing and also membrane thickness. A critical point in surface pressure at 18.4 mN/m has been discovered above which the membrane expands rather than compresses upon switching from trans- to cis- conformation.

Author: Mr WARIAS, Jonas

Co-authors: Mr REISE, Franziska; Mr JACOBSEN, Malte; Dr FESTERSEN, Sven; Dr SHEN, Chen; Mr JORDT, Philipp; Prof. LINDHORST, Thisbe; Prof. MAGNUSSEN, Olaf; Dr MURPHY, Bridget

Presenter: Mr WARIAS, Jonas

Session Classification: Poster session 2

Track Classification: P2 Soft matter