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In vivo nanopatterning of membrane proteins

More than half of all medical drugs target membrane proteins; however, the complex intracellular protein interactions are mostly unknown. Therefore, we are developing a method to study protein-protein-interaction with membrane proteins in a living cell. As model organism we have chosen the T-cell with its T-cell receptor TCR and the related membrane protein CD4. For this method a substrate is required with nanopatterns of streptavidin and fibronectin, catching the cell and reallocate CD4. While for patterns with dimensions in the realms of micrometer contact printing with Polydimethylsiloxan (PDMS) is well established, this is not suitable for nano features. Thus we had to test different materials and methods before we finally were able to show images with total internal reflection fluorescence microscopy (TIRFM) of nanopatterned membrane proteins in vivo.

Marco Lindner obtain his Diploma in Biophysics in 2013 from the University of Bayreuth, Germany. In 2014 he started his PhD at the research institute Profactor GmbH in Austria on nano-imprint- and nano-contact-lithography. After one year he joined Sony DADC BioSciences (now STRATEC Consumables GmbH) for the acquisition and coordination of funded R&D projects and for establishing a laboratory for microfluidic prototyping. In parallel he was continuing his research on nanopatterning of membrane proteins in vivo in close cooperation with the Biophysics group of Gerhard Schütz at the TU Vienna. This work is supported by the Austrian Science Fund FWF.

All interested colleagues are welcome to this seminar lecture (45 min. presentation followed by discussion)

Friedrich Aumayr
(LVA-Leiter)

Gerhard Schütz
(Seminar Chair)