

Cindy Dirscherl & Sebastian Springer

Jacobs University Bremen, Germany

Tuesday, 16th May 2017, 16:00 s.t.

TU Wien, Institut für Angewandte Physik, E134
1040 Wien, Wiedner Hauptstraße 8-10
Yellow Tower „B“, 5th floor, SEM.R. DB gelb 05 B



Interactions of MHC Class I proteins discovered on antibody-micropatterned surfaces

Microcontact printing allows us to generate patterns of antibodies on glass surfaces. If cells that express GFP-tagged 'target' membrane proteins are grown on such antibody micropatterns, the target membrane protein become arranged according to the printed patterns, as seen by fluorescence microscopy. We have applied this approach to Major Histocompatibility Class I (MHC I) proteins, the peptide-binding membrane receptors that play a central role in the adaptive immune system. We have shown that they can be specifically captured on micropatterns in living cells, and that they remain fully functional and even bind their specific peptide ligands. We have expanded this approach towards a two-hybrid *in cis* interaction assay for membrane proteins, where one protein is tagged with an antibody epitope and the other with GFP, and we have discovered that MHC I proteins form such *in cis* interactions with each other. With conformation-specific monoclonal antibodies, we can selectively capture different conformations of MHC I proteins, and it turns out that only peptide-free, but not peptide-bound, MHC I molecules form these clusters. Our work shows that clustering of MHC I is specifically induced by a conformational change, and we hypothesize that these clusters act as initiators of MHC I endocytosis in living cells, since peptide-free MHC I proteins are rapidly removed from the cell surface and routed to lysosomes.

Sebastian Springer holds a PhD in Biochemistry and Immunology from Oxford University. After working with Randy Schekman in Berkeley, Sebastian became a Professor of Biochemistry and Cell Biology at Jacobs University Bremen, Germany. His laboratory is focused on understanding and manipulating the molecular mechanisms of the adaptive immune response against viruses and tumors with interdisciplinary approaches.

Cindy Dirscherl holds an MSc in Cell Biology. She is a senior PhD student in Sebastian's group. Her research interest is protein micropatterning and fluorescence microscopy.

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

Friedrich Aumayr
(LVA-Leiter)

Gerhard Schütz
(Seminar Chair)