

Tuesday, 21<sup>th</sup> June 2022, 16:00 s.t.

TU Wien, Institut für Angewandte Physik, E134  
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Yellow Tower „B“, 5th floor, SEM.R. DB gelb 05 B



## Julia Appenroth

*Institute of Applied Physics*  
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### Electrochemical manipulation of catechol reaction mechanisms

Redox-active catechols, in particular L-DOPA and dopamine, are found in many adhesive biological systems. For example, in marine mussels L-DOPA containing byssus threads are shown to adhere to different substrates in harsh saline environments. Their oxidation and reduction can be driven both by pH changes and electrochemistry. While various models have been proposed, the exact reaction paths of these catechols remain a topic of discussion. To gain more insight into the dynamics and redox activity of catechols in aqueous solution their reaction paths and products were studied using electrochemistry and UV-vis. We further used this knowledge to develop a polymeric hydrogel that was electro-crosslinked and showed high adhesion compared to mussel foot proteins at the polymer/water interface.

By combining these methods, we are able to shed new light on the redox active behaviour of catechols.

## Ulrich Ramach

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### Comparison of protein interaction using membrane model systems and single-molecule measurements

Protein-protein interactions regulate cell communication and are therefore important for our immune system. One protein of interest is the CD4 protein, which is a glycoprotein that serves as a co-receptor for the T-cell receptor (TCR) and can be found on different immune cells. Direct interaction between cells expressing CD4 and cells expressing its counterpart, the major histocompatibility complex class II (MHC II) is reported to be low due to its assisting role in the TCR-MHC II interaction. This interaction is happening in the vicinity of hundreds of different surface proteins as well as glycocalyx proteins like CD45, posing a challenge for accurately mimicking the protein interaction on model membranes.

This work gives an overview of choosing a model membrane system as well as protein-protein interaction using model membranes in SFA and single-molecule AFM.

All interested colleagues are welcome to this seminar lecture(s)  
(2 x 20 min. presentations followed by discussion).

Friedrich Aumayr  
(LVA-Leiter)

Markus Valtiner  
(Seminar Chair)