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Unifying Concepts in Catalysis

UniCat Colloquium

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Precision vs. Flexibility in GPCR signaling: A case study of visual rhodopsin

In the last decade the understanding of G protein coupled receptors and their functional complexes was dominated by X-ray crystallography. Though high resolution structures provide a detailed view of the target protein(s) down to the atomic level, they provide only snapshots of a conformational ensemble which exchanges on the nanosecond to millisecond timescale.

To assess the dynamics of the archetypical GPCR and highly optimized photoreceptor rhodopsin, we use spectroscopic techniques complemented by molecular dynamics simulation. While FTIR difference spectroscopy has the benefit of unraveling couplings between microswitches within the native receptor, side-directed spin labeling combined with EPR spectroscopy offers a unique opportunity to explore the conformational landscape site-specifically from the nanosecond to microsecond timescale.

The results from FTIR spectroscopy and MD simulations suggest how downstream regulatory proteins like G protein or arrestin exploit distinct substates out of the conformational ensemble of the light activated receptor. First EPR results indicate how the conformational equilibria of rhodopsin change upon illumination and how the conformational equilibria of light activated rhodopsin can be shifted by hydrostatic pressure. The latter approach will be used to determine common structural and functional features of GPCRs and their signaling complexes.

Wednesday, July 01, 2015 at 5:15 PM
TU Berlin, Institute of Chemistry
Straße des 17. Juni 115, 10623 Berlin

Building C, Lecture Hall **C 264**

Prof. Bittl (FUB)
Organizer

Coffee and cake will be served 30 minutes before the lecture. Guests are cordially invited to attend!
Prof. Dr. Matthias Driess - Chair of the Cluster of Excellence UniCat - www.unicat.tu-berlin.de