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Quantification of proton pumping and weak, multivalent interactions using single-proteoliposome assays

Proteins supply a variety of different functionalities in biological systems such as specific molecular recognition, enzymatic activity, and molecular transport. The Block lab at the FU Berlin develops new biophysical approaches that allow such functionalities to be quantified on the nm-scale and/or at single-molecule resolution. The talk will introduce some recent examples, in which liposomes are used as readout element in a microscope, thereby yielding high data throughput (due to large parallelization of the measurement process). In particular, a proteoliposome assay will be introduced that quantifies the catalytic turnover of a quinol oxidase (cytochrome bo_3) at single-molecule level. A second example will demonstrate how the transient interaction of an enveloped virus (influenza A/X31) with its native receptor can be used to elucidate the action of virus (binding) inhibitors.