IBI SEMINAR

“Determining the Shape, Dipole Moment, and Rotational Diffusion Constant of Single Proteins”

Thursday – November 1, 2012 – 3:00 p.m. sharp
EPFL – room SV 1717a

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host: Prof. A. Radenovic

Abstract

Recording ionic current through electrolyte-filled nanopores during the passage of proteins is an emerging technique for characterizing unmodified proteins in their native, aqueous environment. This talk demonstrates the use of lipid-bilayer coated nanopores for determining the shape and volume of single, spherical and non-spherical proteins that are anchored to mobile lipids in the coating. This work shows that individual resistive-pulses can also be used to determine the rotational diffusion coefficient and dipole moment of non-spherical proteins while in the nanopore. Moreover, this method has the potential to detect transient changes in the conformation of flexible proteins (e.g. an IgG antibody). We propose that this work extends the power of nanopores for characterizing proteins by adding the parameters of shape, volume, rotational diffusion coefficient, and dipole moment of non-spherical proteins to those that can already be determined in a single experiment such as the volume of spherical proteins, charge, and affinity for a ligand.

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