ETH zürich

ICB seminar series 2017/18
chairman: Prof. Dr. Andrew deMello

NANOFLUIDIC TOOLS FOR SINGLE DNA MOLECULE ANALYSIS

Prof. Dr. Fredrik Westerlund
Department of Biology and Biological Engineering,
Chalmers University of Technology, Gothenburg

ETH Hönggerberg, 21/03/2018
HCI G 3, 17.00 h
The Seminar will be followed by an Apéro

Abstract: Nanofluidic channels have emerged as a promising tool to stretch and visualize single DNA molecules. I will discuss two different lines of research going on in my group regarding nanofluidics and DNA.
We have developed a one step method to map single DNA molecules with kbp resolution and applied it to identification and characterization of bacterial plasmids. Plasmids are relevant because they are responsible for a large fraction of the spread of antibiotic resistance. I will demonstrate how we used our assay to characterize plasmids from a nosocomial outbreak and how this might be used in clinics. We have recently turned our focus to mapping the human genome and I will show preliminary data on this.
We are also using the nanochannels for studying DNA-protein interactions. An important breakthrough to study proteins in nanochannels was our introduction of lipid bilayers as a passivation coating for nanofluidic channels. Using lipid passivated channels, we have been studying several different DNA-binding proteins, including bacterial RecA, Cox from bacteriophages and NC from the HIV-1 virus.

CV: Fredrik Westerlund is Associate Professor at the Division of Chemical Biology, Department of Biology and Biological Engineering, Chalmers University of Technology, Gothenburg, Sweden. FW obtained his PhD in Biophysical Chemistry at Chalmers in 2006 which was followed by a first post doc at the University of Copnehagen 2007-2009 and a second at Gothenburg University 2009-2010. In 2010 FW established his own group at Chalmers focusing on using nanofluidics as a tool for DNA analysis.

ICB Institute for Chemical and Bioengineering

DCHAB Department of Chemistry and Applied Biosciences