SMART

Singapore-MIT Alliance for Research and Technology

SMART BioSyM
Seminar 1

BioSyM
BIOSYSTEMS AND MICROMECHANICS

16 November 2015 – 7 December 2015

Fluorescence (Cross-)Correlation Spectroscopy – What do we learn from fluorescence intensity fluctuations in bio-molecular systems, living cells and embryos?

Seminar 1:

Fluorescence (Cross-)Correlation Spectroscopy – FC(C)S – Principles, Practice, Pitfalls and Perspectives

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Research Fellow

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16th November 2015, Monday
4pm – 5pm
SMART Enterprise Wing Level 5,
Perseverance Rooms 1 & 2

Fluorescence intensity originating from a very small volume element (e.g. a focal volume of a confocal microscope) containing a low number of emitters exhibits pronounced fluctuations caused by blinking of emitters (switching to transient dark states) and variations in their local concentration due to their diffusive movement. When recorded with sufficient temporal resolution and single-molecule sensitivity, such intensity fluctuations can provide valuable information on molecular processes in the sample. FC(C)S extracts such information from correlation functions of such fluctuations. I will introduce the principles of FC(C)S and typical situations in which they are applied. Besides, I will highlight some of the pitfalls and artefacts of the method and touch on approaches to avoid them or at least reduced their impact.

2006-2012 Ph.D. in Biophysics (Charles University in Prague), supervisor: Prof. Martin Hof (Institute of Physical Chemistry of J. Heyrovsky of ASCR, Czech Republic)
2012-2013 Assistant professor, Czech Technical University in Prague, Faculty of Biomedical Engineering
From 2013 Research Fellow, NUS, group of Assoc. Prof. Thorsten Wohland
Expertise: Fluorescence microscopy and spectroscopy, time-resolved fluorescence spectroscopy, FC(C)S in all its modalities, ellipsometry, diffusion of molecules in lipid bilayers and biological membranes, membrane active peptides and their interactions with lipid bilayers (permeation, fusion, etc.)