chemisch
physikalische
gesellschaft

Gegründet im Jahre 1869 von H. Hlasiwetz,
J. Loschmidt, J. Petzval und J. Stefan

EINLADUNG

zum Vortrag von

Dr. Gerhard J. Schütz

Biophysikalisches Institut, Johannes Kepler Universität Linz

über

Single Molecule Microscopy in Living Cells

am

Dienstag, dem 27. Jänner 2004, um 17.30 Uhr

im Großen Hörsaal des Instituts für Experimentalphysik der Universität Wien
1090 Wien, Strudlhofgasse 4 / Boltzmanngasse 5, 1. Stock

A detailed understanding of molecular processes is the basic requirement for the description of cellular function. These processes typically involve the interplay of different proteins, but also of proteins and the lipids in the cell membrane. While large-scale rearrangements of molecular distributions proceed on seconds up to minutes time scales, local changes are much faster. New ultra-sensitive methodologies for imaging single molecules in living cells allow the direct observation of molecular movements on the time scale of milliseconds. As a first example, we investigated the lateral mobility of individual lipid molecules in the plasma membrane of human smooth muscle cells. Transient confinement of certain types of lipids to microdomains supported the current view of the membrane as a highly heterogeneous matrix. In addition, it allowed an estimation of the size of such domains, yielding a broad distribution with a mean of ~500nm. Molecular rearrangements are of particular importance during the stimulation of immune cells. We followed the motion of individual molecules during different phases of T-cell stimulation in the area of the immunological synapse. The mobility of proteins, as they pass the synapse, reveals information upon the microstructure of these cell-to-cell contact areas. Such studies shed further light on the structural relevance of lipid microdomains for T-cell stimulation. Extensions of this technique towards ultra-sensitive 3D Imaging and biochip read-out will be discussed.

Supported by the FWF and the Austrian Federal Ministry of Education, Science and Culture.

CHEMISCH-PHYSIKALISCHE GESELLSCHAFT
c/o Institut für Experimentalphysik der Universität Wien, A-1090 Wien, Strudlhofgasse 4
Sekretär: Ao.Univ.Prof. Dr. Georg REISCHL
Tel.: +43-(0)1-4277/51153, 51108 - Fax: 4277/9511 - Email: CPG@exp.univie.ac.at - http://www.cpg.univie.ac.at
Präsident 2003/04: Ao.Univ.Prof. Dr. Gerhard KAHL
Institut für Theoretische Physik der Technischen Universität Wien