

Programme

Challenges in Optical Nanoscopy, X-ray microscopy and Spectroscopy

Sunday, 27 April 2003

**Project Presentation of the SPP 1128:
Optical analysis of the structure and dynamics of supramolecular biological
complexes**

13:00 **Introduction** C. Cremer (Coordinator), Heidelberg

New Optical Methods

- 13:30 Extension of a Spatially Modulated Illumination Microscope for the Optical
Analysis of Active Chromatin Complexes
U. Spoeri/C. Cremer, Heidelberg
- 13:50 Visualization and Quantitative Evaluation of Molecular and Cellular Structures
Imaged by Cryo Electron Tomography
R. Hegerl, Martinsried
- 14:10 Employing Fluorescence Saturation for the Functional and Spatial Optical
Analysis of Cellular Supramolecular Complexes
R. Heintzmann, Göttingen
- 14:30 Localization and Visualization of Biological Markers and Tracking of Structures
in Living Cells
J. Hesser, Mannheim
- 14:50 Single Molecule Fluorescence Studies of the Structure and Dynamics of Chro-
matin Complexes
J. Langowski, Heidelberg
- 15:10 Coffee break
- 15:40 Observation of Single Transport Events through Single Pore Complexes of the
Nuclear Envelope by Means of Near-Field Optical Microscopy
A. Naber, Münster
- 16:00 Elucidating the Intracellular Mechanism of RNA Interference by Single Mole-
cule Fluorescence Microscopy and Spectroscopy
P. Schwille, Dresden

Nuclear Complexes

- 16:20 Dynamics of Chromatin Accessibility and Proteome Distribution in Living Cells
C. Cardoso, Berlin
- 16:40 Accessibility of Macromolecule Complexes to Active/Inactive Chromatin Regions Studied by Single Particle Tracking of Fluorescent Beads in Live Cell Nuclei
T. Cremer, München
- 17:00 Threedimensional Optical Analysis of Hypoxia Inducible Factor-1 (HIF-1) Activated Nuclear Gene Complexes by Means of 2 P Confocal Laser Scanning and Spatially Modulated Illumination Nanoscopy, and 2P Spectral Precision Distance Microscopy
J. Fandrey, Essen
- 17:20 Dynamic Simulation of Active/Inactive Chromatin Domains
G. Kreth, Heidelberg
- 17:40 Analysis of the In Vivo Chromatin Conformation by High Resolution Fluorescence Microscopy
K. Rippe, Heidelberg

Monday, 28 April 2003

Cytoplasmic Complexes

- 8:30 Imaging Assembly and Turnover of The Presynaptic Cytomatrix
Th. Dresbach, Magdeburg
- 8:50 Mechanics and Fast Conformational Dynamics of the Nuclear Pore Complex
E. – L. Florin, Heidelberg
- 9:10 Molecular and Microscopic Analysis of Dictyostelium Microtubule Plus End Complexes and Their Role in Microtubule/Cell Cortex Interactions
R. Gräf, München
- 9:30 Functional Analysis of Synaptic Cytomatrix Proteins by Novel, Minimal-Invasive Picosecond-FLIM and Picosecond-Anisotropy Fluorescence Imaging Microscopy
W. Zuschratter, Magdeburg

Membrane Complexes

- 9:50 Electron Cryotomography of Excitatory Synapses and the Structural Characterization of the Postsynaptic Molecular Complexes
S. Nickell/P. Baumeister, Martinsried
- 10:10 Coffee break

10:40	Molecular Interactions of a Receptor/Transducer Complex During Photosignaling Studied with Single Molecule Fluorescence Spectroscopy J. Fitter, Jülich
11:00	Dynamics of Membrane-Associated Actin-Arp 2/3 Complexes G. Gerisch, Martinsried
11:20	Translocation of Single Molecules by the Pore Complex of the Nuclear Envelope Analyzed by Low-Light Level Three-Channel Fluorescence Microscopy U. Kubitschek, Bremen
11:40	Role of SNARE Microdomains in Vesicle Docking and Exocytosis Th. Lang, Göttingen
12:00	Investigation of Structure and Function of the COPI- System F. Wieland, Heidelberg
12:20	Lunch

X-ray microscopy and Spectroscopy

13:45	Introduction M.Grunze, Heidelberg
14:00	E. Frey, (HMI) The cytoskeleton: a model system for stiff polymers
14:40	M.Anderson (The Jackson Laboratory, Bar Harbour, Maine) Characterization of melanosomal defects contributing to pigmentary glaucoma
15:20	Coffee break
15:50	J.Kirz, (SUNY) Scanning X-ray spectromicroscopy and lensless imaging
16:30	P. Fratzl (MPI Golm) Imaging of biological tissues with scanning x-ray diffraction and scattering
17:15	Evening Session Chairman C. Cremer S. Eisebitt (BESSY) Soft x-ray spectroscopy and lensless imaging in liquid environments A. Rosenhahn (Heidelberg) Approaching biological questions with in-line holography U. Schade (BESSY) Biological Microscopy utilizing Infrared Synchrotron Radiation M. Himmelhaus (Heidelberg) Perspectives of IR near field microscopy A. Götzhäuser (Marburg)

Low Energy Electron Point Source (LEEPS) Microscopy: A Perspective for Single Molecule Experiments with Synchrotron Light

Marco Arnold (Heidelberg)

Molecularly Defined Densities of Rigid Cell Adhesive Nano-Templates Regulate Adhesion by Control of Integrin Clustering

Wouter Roos (Heidelberg)

Actin Cortex Models

Alexandre Micoulet (Heidelberg):

Mechanical Function of Cytokeratin Assembly in Cancerous Epithelial Cells of Human Pancreas

20:00 Buffet Dinner and Discussions

Tuesday, 29. April 2003

- 8:15 G. Schneider (BESSY)
Visualization of cells and localization of proteins by cryo X-ray tomography
- 8:55 R. Fink (Würzburg)
What can we learn from high-resolution spectroscopy and spectromicroscopy of biological specimens
- 9:35 C. Heske, O. Fuchs, Y. Zubavicus, E. Umbach (Würzburg and Heidelberg)
Soft x-ray spectroscopy of amino acids and liquids
- 9:55 B. Kanngießer (TU Berlin)
Micro X-ray Fluorescence Analysis in Life Science
- 10:35 Coffee break
- 10:55 M. Kuehbacher, G. Weseloh, A. Kyriakopoulos, D. Behne (HMI Berlin)
Combination of Micro-X-Ray-Spectroscopy, SRFTIR-Spectromicroscopy and Micro-Autoradiography in the Investigation of Metalloprotein-Related Life Processes
- 11:15 T. Salditt (Göttingen)
X-ray waveguides: a new tool for x-ray nano-spectroscopy and imaging ?
- 11:55 K. Fahmy (Rossendorf)
Investigation of biomolecular structure and dynamics with infrared radiation
- 12:35 Discussion of the Biosyn Consortium
- 13:30 End of meeting**
- 14:30 Visit of BESSY