Eur Biophys J (2007) 36 (Suppl 1):S19–S36
DOI 10.1007/s00249-007-0176-9

Scientific Programme

SATURDAY, JULY 14th 2007

13.00-17.00 **Student Satellite**
G34, Sir Alexander Fleming Building

17.00-18.00 **Welcome Reception**

18.15-18.30 **Opening Ceremony**
Great Hall, Sherfield Building

18.30-19.30 **PLENARY LECTURE**
Professor Sir John E. Walker, FRS, Medical Research Council, Cambridge, United Kingdom
Oxygen, life and energy conversion
Great Hall, Sherfield Building
Chairman : Professor Sir Leszek K. Borysiewicz, Deputy Rector, Imperial College

SUNDAY, JULY 15th 2007

9.00-10.00 **PLENARY LECTURE**
Kazuhiko Kinosita, Jr., Waseda University, Japan
Single-molecule physiology of protein machines
Great Hall, Sherfield Building
Chairman : M. Ferenczi

10.30-12.30 1. SINGLE MOLECULE MECHANICS
Great Hall, Sherfield Building
Chairs : C. Veigel and M. Rief

Invited speakers
Richard Berry, Oxford, U.K.
Investigation of torque-generation in the bacterial flagellar motor

Christoph F. Schmidt, Göttingen, Germany
Motility and regulation of the tetrameric mitotic kinesin Eg5

Peter Hinterdorfer, Linz, Austria
Applications of Single Molecule Recognition Force Microscopy

Short talks
Jan Philipp Junker, Garching, Germany
Direct observation of equilibrium folding / unfolding transitions of single Calmodulins by AFM

Janusz W. Strzelecki, Torun, Poland
AFM force spectroscopy of braided DNA

Andrej Vilfan, Ljubljana, Slovenia
Myosin V crossing Arp2/3 junctions: Predictions from the elastic lever arm model

10.30-12.30 2. RNA STRUCTURE & FUNCTION
Lecture Theatre 1, Room G16, Sir Alexander Fleming Building
Chairs : D. Lilley and E. Westhof

Invited speakers
Shankar Balasubramanian, Cambridge, U.K.
Structure and function of human telomerase

William Scott, Santa Cruz, California, U.S.A.
The structural basis of ribozyme-catalyzed RNA assembly and its implications for an RNA world

Philippe Dumas, Strasbourg, France
Equilibrium/non-equilibrium transition in biological macromolecule interactions

Frederic Allain, Zurich, Switzerland
Understanding gene regulation from the NMR structures of several protein-RNA complex

Short talk
Dagmar Klostermeier, Basel, Switzerland
smFRET reveals nucleotide- and RNA-induced conformational changes in RNA-helicase mediated unwinding

10.30-12.30 3. LIPID BIOPHYSICS
Mechanical Engineering Lecture Theatre 220
Chairs : J. Seddon and O. Mouritsen

Invited speakers
Peter D. Olmsted, Leeds, U.K.
Model membrane phase behaviour and detergent dissolution

Michael Kozlov, Tel Aviv, Israel
Point-like protrusion as a pre-stalk intermediate in membrane fusion pathway

Patricia Bassereau, Paris, France
Membrane deformations induced by proteins

Short talks
Miglena I. Angelova, Paris, France
The dynamics of mitochondrial cristae – a study involving GUVs and local pH gradient modulation

Michel Lafleur, Québec, Canada
Cholesterol sulphate affects the mixing properties of the main lipid components of stratum corneum

Gemma C. Shearman, London, U.K.
A novel mechanism for drug transport through membranes

12.30-14.30 POSTER SESSION & EXHIBITS

14.30-15.45 NEW & NOTABLE *(to be annonced)*
Great Hall, Sherfield Building
Chairs : A. Watts and G. Columbetti

16.00-18.00 4. MEMBRANE PROTEIN FOLDING
Great Hall, Sherfield Building
Chairs : P. Booth and H. Paulsen

Invited speakers
Harald Paulsen, Mainz, Germany
Folding and assembly of light-harvesting chlorophyll a/b protein: Fluorescence and EPR kinetics

Paula Booth, Bristol, U.K.
Manipulating the assembly of transmembrane helical proteins

José Manuel González-Ros, Elche, Spain
Unfolding and refolding of a predominantly α-helical, tetrameric potassium channel protein

Short talks
Catherine Michaux, Namur, Belgium
Refolding SDS-denatured proteins by the addition of amphipathic cosolvents

Peter Schmidt, Halle-Wittenberg, Germany
Functional characterization of human neuropeptide Y receptors expressed in *E. coli*

Judith Klein-Seetharaman, Pittsburgh, U.S.A.
Comparison of transmembrane and loop contributions to stabilization and folding of membrane proteins

16.00-18.00 5. MULTISCALE SIMULATIONS
Lecture Theatre 1, Room G16, Sir Alexander Fleming Building
Chairs : G. Grant and P. Bolhuis

Invited speakers
Peter Bolhuis, Amsterdam, The Netherlands
The molecular mechanisms of protein folding and signal transduction revealed by multiscale modelling

Jonathan Essex, Southampton, U.K.
Coarse grained modelling of membrane systems

Christof Schütte, Berlin, Germany
Nanomechanics of biomolecules

Short talks
Jean-Marc Allain, Palaiseau, France
Mechanical modelling of the cellular propulsion

Silvia Morante, Roma, Italy
Ab initio studies of amylod-metal complexes: a tool towards understanding misfolding and aggregation

16.00-18.00 6. GLYCOBIOPHYSICS
Mechanical Engineering Lecture Theatre 220
Chairs : A. Dell and A. Imberty

Invited speakers
Anne Imberty, Grenoble, France
Sweet-talk between pathogen and host: structure and thermodynamics of interaction

David Fernig, Liverpool, U.K.
Macromolecular assemblies at the cell surface: complex cell regulation directed by glycan complexity

Bjørn Torger Stokke, Trondheim, Norway
Mesoscale structure formation of polysaccharides: Induction and suppression of toroids

Short talks

Christine Ebel, Grenoble, France
Organization of human interferon gamma -heparin complexes from solution properties and hydrodynamics

Elena del Favero, Milano, Italy
Anomalous phase behaviour of glycolipid self-assembly tuned by sugar headgroup surface arrangement

Bérangère Tissot, London, U.K.
Characterisation of glycans and carbohydrate-binding proteins off chips: new mass spectrometry tools

MONDAY, JULY 16th 2007

9.00-10.00 **PLENARY LECTURE**
So Iwata, Imperial College, London, U.K.
Structure and mechanism of membrane transporters
Great Hall, Sherfield Building
Chairman : Tony (A.) J. Wilkinson

10.30-13.00 7. MACROMOLECULAR ASSEMBLIES
Great Hall, Sherfield Building
Chairs : H. Saibil and R. Beckmann

Invited speakers
Roland Beckmann, Germany
Following the signal sequence by cryo-EM

Carolyn Moores, London, U.K.
A unique mechanism of microtubule stabilisation by doublecortin

Bridget Carragher, La Jolla, U.S.A.
An automated pipeline for macromolecular microscopy: case studies

Carol Robinson, Cambridge, U.K.
Subunit Architecture of protein complexes derived from mass spectrometry

Short talks
Kris Pauwels, Brussels, Belgium
Lipase-specific foldases: steric chaperones as dynamic folding platforms

10.30-12.30 8. PROTON COUPLED ELECTRON TRANSFER IN PHOTOSYNTHESIS
Lecture Theatre 1, Room G16, Sir Alexander Fleming Building
Chairs : J. Barber and W. Junge

Invited speakers
Wolfgang Junge, Germany
Intermediates of photosynthetic water oxidation

Colin Wraight, Urbana, U.S.A.
Design features of long distance proton transport systems in biology

P. Leslie Dutton, Philadelphia, PA, U.S.A.
Exposing the complex III Qo semiquinone radical

Leif Hammarström, Uppsala, Sweden
Mechanisms of proton-coupled electron transfer from tyrosine and tryptophan in model complexes

Daniel G. Nocera, Cambridge, Massachusetts, U.S.A.
Proton-coupled electron transfer. The mechanistic engine that drives photosynthesis

10.30-12.30 9. DNA/LIPID COMPLEXES AND DRUG DELIVERY
Mechanical Engineering Lecture Theatre 220
Chairs : J. Lawrence and J. Rädler

Invited speakers
Joachim Rädler, München, Germany
Stochasticity in artificial gene transfer: single cell gene expression experiments and modelling

Clive Roberts, U.K.
Single molecule imaging and force spectroscopy of nucleic acid-protein complexes

Stefaan de Smedt, Ghent, Belgium
Taking lipid/oligonucleotide complexes from buffer to living cells: A biophysical understanding of the factors influencing oligonucleotide delivery

Short talks
Marie-Pierre Rols, Toulouse, France
Can lipid domains control drugs and DNA uptake in cells submitted to electric fields?

Sónia T. Henriques, Lisboa, Portugal
Cell-penetrating peptides can translocate without pore formation. A biophysical study with pep-1

12.30-14.30 POSTER SESSION & EXHIBITS

13.30-14.15 BBS MEDAL LECTURE
Great Hall, Sherfield Building
Chairman : Anthony Watts
Lars J. C. Jeuken, University of Leeds, United Kingdom
Electrodes for redox-active membrane proteins

14.30-15.30 **PLENARY LECTURE**
Ad Bax, National Institutes of Health, U.S.A.
Insight into structure and dynamics from weak alignment NMR
Great Hall, Sherfield Building
Chairman : A. Watts

16.00-18.00 10. LIVE CELL IMAGING
Great Hall, Sherfield Building
Chairs : D. Davis and P. Schwille

Invited speakers
Petra Schwille, Dresden, Germany
New trends in fluorescence correlation spectroscopy

Justin Molloy, London, U.K.
Direct observation of single muscarinic acetylcholine receptors in live cells

Hans-Hermann Gerdes, Bergen, Norway
Tunnelling nanotubes, a novel route of cell-to-cell communication

Short talks
Sophie Pautot, Berkeley, U.S.A.
Role of neuroligin-1 oligomerization for the neuronal synapse formation probed by FLIM

Ilaria Testa, Genoa, Italy
PA-GFP 3-D localized photo-activation and tracking in living cells

Richard K. Benninger, Nashville, U.S.A.
Studying inter-cellular calcium wave propagation in pancreatic islets

16.00-18.00 11. ION CHANNELS: STRUCTURE AND FUNCTION
Lecture Theatre 1, Room G16, Sir Alexander Fleming Building
Chairs : D. Wray and D. Doyle

Invited speakers
Annette Dolphin, London, U.K.
Voltage-gated calcium channel $\alpha 2\delta$ subunits and their role as drug targets and in disease

Yasushi Okamura, Okazaki, Japan
Mechanisms and biological roles of voltage-sensor domain proteins.

Olaf Pongs, Hamburg, Germany
Structural analysis of potassium-channel-ligand complexes

Short talks
Simone Furini, Bologna, Italy
Structural and functional characteristics of the alpha-Haemolysin channel in the hexameric form

Claudio Melis, London, U.K.
Mutagenesis computer experiments on ligand-gated ion channels

Mauro Dalla Serra, Povo, Italy
Structure of the fuscopeptin pore on lipid membranes

16.00-20.15 12. PROTEIN-LIGAND INTERACTIONS
Mechanical Engineering Lecture Theatre 220
Chairs : J. Ladbury and T. Härd

Invited speakers
Torleif Härd, Göteborg, Sweden
Protein folding coupled to binding or autoproteolysis

Steve Homans, Leeds, U.K.
Dynamics and thermodynamics of ligand-protein interactions

Gerhard Klebe, Marburg, Germany
Combining isothermal titration calorimetry, crystallography and computational approaches to understand protein-ligand interactions

Rebecca Wade, Heidelberg, Germany
Modeling and simulation of protein-protein recognition and binding

Andy Davis, Loughborough, U.K.
Applications and limitations of use of X-ray structures in structure-based ligand design

Short talks
Travis Beddoe, Melbourne, Australia
A new mode of recognition: an entropically favoured T-cell receptor

Stefan T. Arold, Montpellier, France
Evolution of quorum sensing in Gram-positive bacteria revealed by the structure of PlcR

18.15-20.15 13. SINGLE MOLECULE IMAGING AND SPECTROSCOPY
Lecture Theatre 1, Room G16, Sir Alexander Fleming Building
Chairs : D. Klenerman and M. Sauer

Invited speakers
Markus Sauer, Bielefeld, Germany
Probing fast conformational dynamics of biomolecules by photoinduced electron transfer (PET)-FCS

Yuri Korchev, London, U.K.
Biomedical applications of scanning ion conductance microscopy

María F. García-Parajó, Barcelona, Spain
Single molecule NSOM microscopy resolves distinct nano-scale compartments on the cell membrane

Short talks
Andrew P. Carter, San Francisco, U.S.A.
Changing the length of the dynein stalk alters step size but not directionality

Liming Ying, London, U.K.
Nanopipette dosing for triggered single molecule experiments

TUESDAY, JULY 17th 2007

9.00-10.00 **PLENARY LECTURE**
Cécile Sykes, Institut Curie, Paris, France
Building cell movements step by step
Great Hall, Sherfield Building
Chairman : E. J. Dufourc

10.30-12.30 14. MEMBRANE MICRODOMAINS & SIGNALLING
Great Hall, Sherfield Building
Chairs : T. Magee and E. J. Dufourc

Invited speakers
Paul O'Shea, Nottingham, U.K.
Structural modulation of receptor-mediated signalling activity in membrane microdomains

Manuel Prieto, Lisbon, Portugal
Modulation of membrane lateral organization by the interplay of ceramide with lipid rafts

Paavo Kinnunen, Helsinki, Finland
Membrane microdomains: physics serving biology

Short talks
Salvatore Chiantia, Dresden, Germany
Membrane protein organization and ceramide domains: a combined AFM and FCS study

Didier Marguet, Marseille, France
Dynamic map of the plasma membrane organization by FCS & Multiple Target Tracing analyses

Anca Margineanu, Leuven, Belgium
Estimation of rafts size and dynamics from single molecule confocal microscopy of a new membrane dye

10.30-12.30 15. ORGANELLE MOTILITY
Lecture Theatre 1, Room G16, Sir Alexander Fleming Building
Chairs : M. Seabra and A. Houdusse

Invited speakers
Anne Houdusse, Paris, France
Myosin Structures : What they reveal about the motor mechanism

Folma Buss, Cambridge, U.K.
The role of Myosin VI in protein sorting and post Golgi membrane trafficking

Dominique Soldati, Genève, Switzerland
The glideosome: the machinery powering gliding motility and host cell invasion in apicomplexan parasites

Short talks

Michael A. Ferenczi, London, U.K.
Time-course and strain dependence of ADP-release during contraction of permeabilised muscle fibres

Guillaume Romet-Lemonne, Gif-sur-Yvette, France
Actin-based propulsion of GUVs is controlled by Arp2/3 complex and membrane-diffusion of N-WASP

Luis M. Gutiérrez, Alicante, Spain
SNARE cluster dynamics influences chromaffin granule motion and probability of fusion

10.30-12.30 16. INTERACTION AND RECOGNITION OF DNA
Mechanical Engineering Lecture Theatre 220
Chairs : A. Kornyshev and S. Lemay

Invited speakers

Serge G. Lemay, Delft, Netherlands
Condensation of single DNA molecules by multivalent ions observed using magnetic tweezers

Helmut Schiessel, Leiden, Netherlands
The nucleosome: A transparent, slippery, sticky and yet stable DNA-protein complex

Sergey Leikin, Bethesda, MD, U.S.A.
Structure-dependent interactions between DNA double helices

Short talks

Geoff S. Baldwin, London, U.K.
Spontaneous separation of homologous DNA duplexes in a protein-free environment

Deshmukh Gopaul, Paris, France
Integron Integrases:Broad DNA specificity and bacterial adaptation

Alexander M. Polyanichko, Saint Petersburg, Russian Federation
Structural organization of the DNA-HMGB1 complexes revealed by VCD and AFM studies

12.30-15.30 POSTER SESSION & EXHIBITS

14.00-15.30 EBSA GENERAL ASSEMBLY
Great Hall, Sherfield Building

16.00-18.00 17. BIONANOMATERIALS & DESIGN
Great Hall, Sherfield Building
Chairs : A. Turberfield and T. Scheibel

Invited speakers
Thomas Scheibel, Garching, Germany
Spider silk – a basis for new materials

Tony Cass, London, U.K.
Functional interfaces between biomolecules and nanomaterials

Paul W. K. Rothemund, Pasadena, U.S.A.
DNA origami: folding DNA to create arbitrary shapes and patterns

Short talks
Claudia Steinem, Göttingen, Germany
Functional studies on membrane proteins using micro- and nano-BLMs

Yavuz Erkan, Gothenburg, Sweden
SU-8 patterned chips for controlled film formation: lipid monolayer spreading and DNA immobilization

Tatiana Schmatko, Strasbourg, France
From lambda DNA grafted colloids with specific binding ends to finite size clusters

16.00-18.30 18. FLUORESCENT PROTEINS: APPLICATIONS
Lecture Theatre 1, Room G16, Sir Alexander Fleming Building
Chairs : S. Meech and A. Zumbusch

Invited speakers
Andreas Zumbusch, Konstanz, Germany
Comparative FCS- and TCSPC studies on autofluorescent proteins

Clive Bagshaw, Leicester, U.K.
Complexities of Green Fluorescent Proteins as probes in biological systems.

Dan Huppert, Tel-Aviv, Israel
Excited state proton transfer in the green fluorescent protein and its mutants

Short talks
Cristina Flors, Leuven, Belgium
Ultrafast excited-state dynamics of the photoswitchable protein Dronpa

Jasper J. van Thor, London, U.K.
High resolution structural details of functional dynamics in the Green Fluorescent Protein

16.00-18.00 19. CHEMOTAXIS AND SIGNAL TRANSDUCTION
Mechanical Engineering Lecture Theatre 220
Chairs : T. Duke and V. Sourjik

Invited speakers
Victor Sourjik, Heidelberg, Germany
Signal amplification and noise in bacterial chemotaxis

Cornelis Weijer, Dundee, U.K.
Chemotactic cell movement and its role development

Luis Alvarez, Jülich, Germany
Biophysics of chemotaxis in sperm

Short talks
Benjamin M. Friedrich, Dresden, Germany
Theoretical description of chemotaxis in sperm

Roberto Marangoni, Pisa, Italy
Photoresponses in *H. halobium* simulated via systems biology approach

WEDNESDAY, JULY 18th 2007

9.00-10.00 **PLENARY LECTURE**
James Spudich, Stanford, U.S.A.
Regulation of the cell´s dynamic city plan and the myosin family of molecular motors
Great Hall, Sherfield Building
Chairman : C. Veigel

10.30-12.30 20. SINGLE MOLECULE FLUORESCENCE
Great Hall, Sherfield Building
Chairs : J. Molloy and G. Schütz

Invited speakers
Gerhard Schütz, Linz, Austria
Addressing plasma membrane structure at the nanometer length scale

David Klenerman, Cambridge, U.K.
New methods in single molecule fluorescence

Ulrich Kubitscheck, Bonn, Germany
Real-time single molecule microscopy in living cell nuclei

Short talks
Irina V. Perevoschikova, Moscow, Russian Federation
Brightness analysis of isolated mitochondria doped with TMRE and Mitotracker

Stefan Lakämper, Göttingen, Germany
The effect of monastrol on the motility of a Eg5-head/DmKHC-stalk chimera

Gert-Jan Bakker, Barcelona, Spain
The influence of cations on the cluster mobility of LFA-1 in living cells

10.30-12.30 21. ELECTRON TRANSFER
Lecture Theatre 1, Room G16, Sir Alexander Fleming Building
Chairs : J. Butt and M. Ubbink

Invited speakers
Marcellus Ubbink, Leiden, Netherlands
Transient protein electron transfer complexes studied by NMR

Nigel Scrutton, Manchester, U.K.
Isotope effects and tunneling in enzyme systems

Brian R. Crane, Ithaca, New York, U.S.A.
Electron tunneling and conformational change in protein redox reactions

Short talks
Julea Butt, Norwich, U.K.
Enzymes on the edge - voltammetric studies of a multiheme cytochrome

Jochen Blumberger, Cambridge, U.K.
Franck-Condon factors for intra-protein electron transfer reactions from MD simulation

Dima A. Bloch, Helsinki, Finland
Thermodynamic properties of the redox centers in aa3-type cytochrome c oxidase

10.30-12.30 22. ION CHANNELS & CANCER
Mechanical Engineering Lecture Theatre 220
Chairs : M. Djamgoz and B. Soria

Invited speakers
Bernat Soria, Elche, Spain
Ionic channels in non-differentiated proliferative cells

Scott Fraser, London, U.K.
Electrophysiological effects of estrogen on voltage-gated Na^+ channels in human breast cancer cells

Zbigniew J. Grzywna, Gliwice, Poland
On the first passage time distributions for K channels of the cancer cells.

Annarosa Arcangeli, Firenze, Italy
Unconventional ion channel signalling in cancer cells: interaction with adhesion receptors.

Short talk
Bryan R. Downie, Göttingen, Germany
Eag1 potassium channel non-canonical function induces upregulation of cancer genes

12.30-13.30 POSTER SESSION & EXHIBITS

14.00-16.00 23. DISORDERED AND AGGREGATED PROTEINS
Great Hall, Sherfield Building
Chairs : G. Roberts and P. Tompa

Invited speakers
Peter Tompa, Budapest, Hungary
Structural disorder and the functional promiscuity of proteins

David T. Jones, London, U.K.
Inferring protein function from patterns of native disorder

Keith Dunker, Indianapolis, Indiana, U.S.A.
Protein intrinsic disorder, cell signalling, and alternative splicing

Short talks
Colin Kleanthous, York, U.K.
Molecular mimicry by an intrinsically unstructured protein

Véronique Receveur-Bréchot, Marseille, France
The natively unfolded transcription activator Tat protein from HIV-1 is almost a random coil

Andras Szilágyi, Budapest, Hungary
The twilight zone between order and disorder

14.00-16.00 24. PHOTODYNAMIC THERAPY
Lecture Theatre 1, Room G16, Sir Alexander Fleming Building
Chairs : D. Phillips and G. Jori

Invited speakers
Giulio Jori, Padova, Italy
Photothermal sensitisation as a novel therapeutic approach for tumours

Sandy MacRobert, London, U.K.
Photosensitisers for photodynamic therapy and photochemical internalisation

Hubert van den Bergh, Lausanne, Switzerland
Photodynamic therapy (PDT) for treating age related macular degeneration (ARMD)

Short talks
Nicolae S. Stanciu, Bucharest, Romania
Biophysical features of the VEP

Karin A. Riske, Sao Paulo, Brazil
Observing the irradiation of a photosensitizer incorporated in giant unilamellar vesicles

14.00-16.00 25. MOTOR PROTEINS IN RNA/DNA METABOLISM
Mechanical Engineering Lecture Theatre 220
Chairs : M. Szczelkun and R. Tuma

Invited speakers
Mark Szczelkun, Bristol, U.K.
Mechanism, control and diversity of molecular motors on DNA

Roman Tuma, Helsinki, Finland
Mechanism of RNA translocation by a viral packaging motor

Peixuan Guo, West Lafayette, Indiana, U.S.A.
Single molecule detection of six pRNAs and direct observation of phi29 DNA-packaging motor with customized single molecule dual-view system

Eckhard Jankowsky, Cleveland, U.S.A.
RNA helicases: ATP-driven switches and motors for RNA structural changes

Achillefs N. Kapanidis, Oxford, U.K.
Single-molecule studies of sigma54-dependent transcription

16.30-17.15 EBSA Prize Lecture
Great Hall, Sherfield Building
Chairman : Erick J. Dufourc
Marc Baldus, Max Planck Institute for Biophysical Chemistry, Göttingen, Germany
Studying structure and dynamics of protein complexes by solid-state NMR spectroscopy

17.15-17.45 Poster Prize Awards and Closing Ceremony
Great Hall, Sherfield Building

18.00-20.00 EBSA Executive Committee Meeting
Room 128, first floor, Sir Alexander Fleming Building

OTHER EVENTS

Saturday	**15.00-17.00**	EBSA Executive Committee Meeting *Room 128, first floor, Sir Alexander Fleming Building*
Sunday	**18.30-19.45**	Concert: *Ruth Waterman Explores and Performs Beethoven's Spring Sonata, plus Barber's Canzona and Prokofiev's March* Ruth Waterman, *violin*; Timothy Carey, *piano* *Great Hall, Sherfield Building*
Monday	**13.00-14.30**	National Societies Meeting
Tuesday	**12.30-16.00**	EBSA lunch (by invitation) and General Assembly, 14:30-16:00 *Great Hall, Sherfield Building*
Wednesday	**18.00-20.00**	EBSA Executive Committee Meeting *Room 128, first floor, Sir Alexander Fleming Building*