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# 4<sup>th</sup> European Biophysics Congress

Alicante (Spain), July 5–9, 2003

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## Scientific Program

**SUNDAY, JULY 6<sup>TH</sup> 2003**

**9.00–10.00 Plenary Lecture. IUPAB Lecture.**  
**Stas Kolesnikov, Puschino Moscow Region, (Russia)**

**Morning, 10.30–12.30**

### 1. LIPID PROTEIN INTERACTIONS

In collaboration with COST Chemistry Action D22 on Lipid Protein Interactions

*Chairmen: P. Devaux and J.M. Gonzalez-Ros*

- 10.30–10.55 J. L. Popot**, CNRS, Paris, France  
Amphipols: Polymeric surfactants for membrane biology research
- 10.55–11.20 A. Killian**, Utrecht University, The Netherlands  
Biophysical approaches to characterize the lateral distribution of proteins and lipids in model membranes
- 11.20–11.45 M. Prieto**, IST, Lisboa, Portugal  
Cationic peptide interaction with two-component membranes.  
Domain formation or vesicle aggregation?
- 11.45–12.10 P. Kinnunen**, University of Helsinki, Finland  
Interactions of antimicrobial peptides with model biomembranes
- 12.10–12.35 J. Villalain**, University Miguel Hernández, Spain  
Membrane fusion and gp41: How HIV enters the cell

### 2. THEORETICAL BIOPHYSICS

*Chairmen: J.G. de la Torre and R. Lavery*

- 10.30–10.55 Alfonso Valencia**, Madrid, Spain  
Methods for the prediction (and extraction) of protein interactions
- 10.55–11.20 Artur Baumgartner**, Juelich, Germany  
The Physics of Cell Locomotion
- 11.20–11.45 Jiri Sponer**, Brno, Czech Republic  
Structure, molecular interactions and dynamics of DNA and RNA.  
Modern Computational view
-

- 11.45–12.10** **Michele Vendruscolo**, Cambridge, UK  
Determination of the structures of partially folded states of proteins from NMR data

*Oral communication*

- 12.10–12.25** **Alessandra Magistrato, U. Rothlisberger and M. Klein.**  
Characterisation of the dizinc analogue of the synthetic diiron protein DFI using ab initio and hybrid quantum/classical molecular dynamics simulation.

### 3. EMERGING TECHNIQUES

*Chairmen: L. Bagatolli and J.L. Arrondo*

- 10.30–10.55** **Bernard Desbat**, Bordeaux, France  
Study by PMIRRAS and Brewster Angle Microscopy of Phospholipid Bilayer Stabilised at the Air/Water Interface
- 10.55–11.20** **Alberto Diaspro**, Genova, Italy  
Confocal and Multiphoton techniques from microscopy down to the single molecule level
- 11.20–11.45** **Jesus Ruiz-Cabello**, Madrid, Spain  
Lung function studies by MRI with hyperpolarized  $^3\text{He}$
- 11.45–12.10** **Joachim Spatz**, Heidelberg, Germany  
Micro- and Nanolithographical Tools for Control Integrin Clustering and Models of the Actin Cortex
- 12.10–12.35** **Janos Szollosi**, Debrecen, Hungary  
Combination of modern microscopic techniques (CLSM, AFM, SNOM, FRET) to reveal organization of membrane proteins

**Afternoon, 15.00–17.00**

### 4. CHARGE TRANSFER AND BIOENERGETICS

*Chairmen: A. Xavier and A. Melandri*

- 15.00–15.30** **M.A. de la Rosa**, Sevilla, Spain  
Electron transfer from cytochrome *b<sub>f</sub>* to photosystem *i* as mediated by cytochrome *c<sub>6</sub>* and plastocyanin
- 15.30–16.00** **T. Prisner**, Frankfurt, Germany  
EPR spectroscopical characterization of the first electron acceptor in cytochrome *c* oxidase and ubiquinol oxidase complexes
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**16.00-16.30 S. Ferguson, Oxford, UK**

The thioether bonds in c-type cytochromes –  
formation and purpose present many puzzles

*Oral Communications*

**16.30-16.45 V. V. Lemeshko. Mitochondrial permeability transition and NAD(P)H oxidation**

**16.45-17.00 E. Urbankova, A.M. Voltchenko, P. Pohl, P. Jezek and E.E. Pohl.**

Carrier-like transport kinetics of uncoupling proteins: analysis of planar bilayers  
reconstituted with UCP1

**17.00-17.15 L. Baciou, A. Kuglstatter, J. Breton, P. Sebban, G. Fritzsche and E. Navedryk.**

Unique or multiple QB binding site in the reaction centers from Rhodospirillum  
rubrum

## 5. NUCLEIC ACID AND RIBOSOMES

*Chairmen: A. Yonath and J. L. Micol*

**15.00-15.30 Irit Sagi, Rehovot, Israel**

Structural-Dynamic Studies of the RNA Helicase DbpA at Atomic and  
Molecular Levels

**15.30-16.00 Avi Minsky, Rehovot, Israel**

Thermodynamic and Structural Aspects of DNA repair in Bacteria.

**16.00-16.30 Rolf Hilgenfeld, Luebeck, Germany**

Structural basis of stringent response in bacteria

**16.30-17.00 Harald Schwalbe, Frankfurt, Germany**

RNA Structure Determination of Ribosomal Protein L11 and Investigation of  
Hammerhead ribozyme by time-resolved NMR

## 6. PROTEIN STRUCTURE, DYNAMICS AND FUNCTIONS (I)

*Chairmen: M. Coll and T. Wilkinson*

**15.00-15.25 Maria Carrondo, Oeiras, Portugal**

Ferritins, bacterioferritins: iron uptake and storage. structure of the d.  
desulfuricans bacterioferritin

**15.25-15.50 Ignacio Fita, Barcelona, Spain**

The Catalase-Peroxidase KatG Structure: Activation of Isoniazide and  
Resilient Mechanisms in Tuberculosis

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- 15.50–16.15** **Dusan Turk**, Ljubljana, Slovenia  
Inhibition of lysosomal cysteine proteases (cathepsins)
- 16.15–16.40** **Fritz G. Parak**, Garching, Germany  
Physical aspects of protein dynamics and function  
*Oral Communications*
- 16.40–16.55** **Gennady M. Verkhivker**. Computational engineering of protein-protein interfaces for structure-based drug design: from detecting binding sites and identifying hot spots on protein surfaces to designing novel inhibitor scaffolds and specificities.
- 16.55–17.10** **J. Meyer, E. Ennifar, F. Buchholz, F. Stewart and D. Suck**.  
Crystal structures of a wild-type Cre recombinase-Lox p synaptic complex.
- 17.30–18.30** **Plenary Lecture. M. Salas, Madrid, (Spain)**

## MONDAY, JULY 7<sup>TH</sup>, 2003

**9.00–10.00** **Plenary Lecture. EBSA Prize Lecture.**

**Morning, 10.30–12.30**

### 7. PROTEIN STRUCTURE, DYNAMICS AND FUNCTIONS (II)

*Chairmen: J. Janin and J.C. Gómez-Fernández*

- 10.30–10.55** **Udo Heinemann**, Berlin, Germany  
Structural genomics: An overview and the Protein Structure Factory
- 10.55–11.15** **Herman Van Tilbeurgh**, Gif-sur-Yvette, France  
Yeast Structural genomics: High throughput production and crystallization of large sets of eukaryotic proteins
- 11.15–11.40** **N. Nielsen**. Aarhus, Denmark  
Biological solid-state NMR. Application to membrane proteins.
- 11.40–12.00** **AR Viguera**. Bilbao, Spain  
Folding intermediates in elongated variants of alfa-spectrin SH3 domain  
*Oral Communication*
- 12.00–12.15** **E. Goormaghtigh**. Differences FTIR spectroscopy and hydrogen deuterium exchange to describe conformational changes in membrane proteins.
- 12.15–12.30** **L. Bubacco, A. Tepper, G.W. Canters and M. Benfatto**.  
Structural basis of tyrosinase function.
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## 8. SINGLE MOLECULE BIOPHYSICS

*Chairmen: R. Rigler and H. Gaub*

- 10.30–11.00 Matthias Rief**, Munich, Germany  
Structural and conformational mechanics of single biomolecules
- 11.00–11.30 Ulrich Bockelmann**, Paris, France  
Exploring energy landscapes and structural fluctuations by force measurements: the example of DNA.
- 11.30–12.00 Gerhard Schuetz**, Linz, Austria  
Ultra-sensitive Microscopy to Image Molecular Rearrangements during T-cell stimulation.

## 9. BIOMATERIALS AND BIONANOTECHNOLOGY

*Chairmen: J. Ryan and P. de Aza*

- 10.30–11.00 S de Aza**, Madrid, Spain  
A new bioactive material: Bioeutectic®
- 11.00–11.30 A. Turberfield**, Oxford, UK  
DNA nanostructures: artificial crystals and synthetic motors
- 11.30–12.00 J. L. López-Lacomba**, Madrid, Spain  
Osteointegration improvement using BMP2.

*Oral Communications*

- 12.00–12.15 W. J. Parak**, Biological applications of quantum dots.
- 12.15–12.30 A. C. Duncan, P. E. Puig, J. C. Zeeh, D. Dupont, W. Boireau**.  
Supramolecular assembly of redox Proteins and Nucleic acids onto a supported bilayer.

**Afternoon, 15.00–17.15**

## 10. ION CHANNELS (I)

*Chairperson: A. Ferrer-Montiel*

- 15.00–15.30 Enzo Wanke**, Milan, Italy  
Known and putative physiological roles of ERG and ELK ion channels
- 15.30–16.00 Rosa Planells**, Hamburg, Germany  
Intracellular chloride channels in neurodegeneration

- 16.00–16.30**    **Stefano Ferroni**, Bologna, Italy  
Functional and Molecular characterization of a two-P-domain potassium channel in astroglial cells
- 16.30–17.00**    **Alvaro Villarroel**, Madrid, Spain  
Molecular determinants for KCNQ2/3 heteromeric potassium  
M-channel potentiation  
*Oral Communication*
- 17.00–17.15**    **J. Nilsson, M. Madeja and P. Arhem.**  
Molecular mechanisms of general anesthetics: selective effects on Kv channels

## 11. BIOPHYSICS AND BIOENGINEERING OF SENSORY SYSTEMS

*Chairmen: F. Lenci and E. Fernández*

- 15.00–15.30**    **Josef Ammermüller**, Oldenburg, Germany  
Temporal structure of signal processing in the retina
- 15.30–16.00**    **Thomas Duke**, Cambridge, UK  
Active detection of sound in the inner ear
- 16.00–16.30**    **K. J. Hellingwerf**, Amsterdam, The Netherlands  
The photochemistry of photobiology, with PYP and AppA as prime examples
- 16.30–17.00**    **Linda Field**, Rothamsted Research, UK  
The use of insects as biosensors for the detection of volatile compounds  
*Oral Communication*
- 17.00–17.15**    **H. J. Steinhoff, A. Wegener, J. Klare and M. Engelhard.**  
Site-directed spin labeling reveals the structure and conformational changes of the sensory rhodopsins-transducer complex.

## 12. WATER TRANSPORT ACROSS BIOLOGICAL MEMBRANES: BIOPHYSICS, REGULATION AND MOLECULAR ASPECTS

*Chairmen: G. Calamita and M. Echevarria*

- 15.00–15.30**    **B. de Groot**, Goettingen, Germany  
Structure, dynamics and mechanism of water permeation through aquaporins
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- 15.30–16.00**    **P. Deen**, Nijmegen, The Netherlands  
The cell biology of the Aquaporin-2 water channel: to pee or not to pee
- 16.00–16.30**    **T. Zeuthen**, Blegdamsvej, Denmark  
Water Transport by Cotransporters
- Oral Communication*
- 16.30–16.45**    **C. Delamarche, C. Raguene-Nicol, L. Duchesne, H. Gueune, D. Thomas and J-F Hubert.**  
Function structural properties and molecular model of a bacterial aquaglyceroporin
- 16.45–17.00**    **O. Beckstein and M.S.P. Sansom.**  
Liquid-vapour oscillations of water in hydrophobic nanopores.
- 17.30–18.30**    **Plenary Lecture. European Science Policies**

## TUESDAY, JULY 8<sup>TH</sup>, 2003

**9.00–10.00**    **Plenary Lecture. Prof. Ernst Bamberg, Frankfurt (Germany)**

**Morning, 10.30–12.30**

### 13. MEMBRANE STRUCTURE AND DYNAMICS

*Chairmen: A. Blume and F. Gavilanes*

- 10.30–10.55**    **T. Schirmer**, Basel, Switzerland  
Structure and simulated function of bacterial porins
- 10.55–11.20**    **J. M. Rysschaert**, Brussels, Belgium  
Probing conformational changes of a multidrug ABC transporter during the catalytical cycle
- 11.20–11.45**    **C. Glaubitz**, Frankfurt, Germany  
Multidrug efflux pumps investigated by solid-state NMR
- 11.45–12.10**    **R. H. Templer**, London, UK  
Staying alive – evidence on how cells maintain their lipid membrane
- 12.10–12.35**    **Thorsten Lang**, Göttingen, Germany  
Structure and function of SNARE-proteins studied on „unroofed cells“

## 14. MOLECULAR MACHINES

*Chairmen: J. Molloy and J.M. Valpuesta*

- 10.30–11.00 J. M. Valpuesta**, Madrid, Spain  
Structure and function of a folding nanomachine: the cytosolic chaperonin CCT
- 11.00–11.30 C. Veigel**, London UK  
Measurement of strain-dependent kinetics of single myosin molecules
- 11.30–12.00 J. Prost**, Paris, France  
Macroscopic manifestations of molecular motors
- Oral Communications*
- 12.00–12.10 E. J. G. Peterman, L.C. Kapitein and C.F. Schmidt.**  
Kinesin studied with single-pair forster resonance energy transfer.
- 12.10–12.20 R. A. Bockmann and H. Grubmüller.**  
Energy transmission in F1-ATP synthase by molecular dynamic simulations.
- 12.20–12.30 A. Vilfan and T.A.J. Duke.** Instabilities in muscle transient response.

## 15. MACROMOLECULAR ASSEMBLIES

*Chairmen: J. L. Carrascosa and A. Brisson*

- 10.30–10.55 A. Hoenger**, Heidelberg, Germany  
Cryo-EM and 3-D analysis of microtubules and associated proteins
- 10.55–11.20 A. Muga**, Bilbao, Spain  
Nucleoplasmin phosphorylation: structural basis for protein activation
- 11.20–12.45 D. Gulino**, Grenoble, France  
The endothelial adhesive receptor VE cadherin: self-assembly and biological properties
- Oral Communications*
- 11.45–12.00 O. Llorca, J. Boskovic, A. Rivera-Calzada, L. H. Peral and K. R. Willinson.**  
Electron microscopy and 3D reconstruction of DNA repair.
- 12.00–12.15 C. Lavelle, M. Barbi, A. Lesne, J. Mozziconacci, A. Prunell and J. M. Victor.**  
Intra and inter-nucleosomal dynamics.
- 12.15–12.30 V. V. Kuvichkin.**  
The role of lipid-DNA interactions in nuclear envelope assembly.
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**Afternoon, 15.00–17.00**

**16. CELLULAR BIOPHYSICS (Prof. Peter Bayley Symposium)**

*Chairmen: S. Martin and A. Nadal*

- 15.00–15.25 Kirsten Bacia**, Dresden, Germany  
Dynamic studies of membrane structure and endocytic processes using fluorescence correlation spectroscopy
- 15.25–15.50 Eva Nogales**, Berkeley, USA  
Structural basis of microtubule dynamic instability
- 15.50–16.15 Carlos Villalobos**, Valladolid, Spain  
Redistribution of Ca<sup>2+</sup> among cytosol and organelle in excitable cells
- 16.15–16.40 Gregory Harms**, Würzburg, Germany  
Probing single-ion channel dynamics

*Oral Communications*

- 16.40–16.55 S. V. Tran, S. Huet, C. Desnos, J. S. Schonn, F. Darchen, I. Fanget, C. Chapuis, S. Cribier and J. P. Henry.**  
Secretory vesicle movements in living cells observed by TIRFM: Effect of Rab 27A and its effector MyRIPT.

**17. TRANSMEMBRANE SIGNALLING**

*Chairman: S. Damjanovich*

- 15.00–15.25 Hannes Stockinger**, Vienna, Austria  
Membrane microdomains in signal transduction of immune cells
- 15.25–15.50 Sandor Damjanovich**, Debrecen, Hungary  
Transmembrane signaling in the light of electro-immunology
- 15.50–16.15 Peter Nagy**, Goettingen, Germany  
Study of homoassociation of transmembrane receptors and Ras proteins using energy migration FRET (emFRET)
- 16.15–16.40 Mario Mellado**, Madrid, Spain  
Chemokine signaling and functional responses: Role of receptor dimerization and TK pathway activation
- 16.40–17.05 Akihiro Kusumi**, Nagoya, Japan  
Frequency-modulated signal transduction based on transient signaling rafts in the cell membrane: a single molecule approach
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## 18. ION CHANNELS (II)

*Chairmen: Thorsten Lang, Wolfgang Fisher*

- 15.00–15.30 Marjan Rupnik**, Goettingen, Germany  
Whole-cell potassium channel conductances in pancreatic tissue slice preparation
- 15.30–16.00 Wolfgang Fischer**, Oxford, UK  
Structure-function correlation of a membrane protein in a 'jig saw' approach:  
Vpu from HIV-1
- 16.00–16.30 Martin Oheim**, Paris, France  
Ca<sup>2+</sup> regulation of exocytosis. Lessons from single vesicles and few ion channels.  
*Oral communications*
- 16.40–16.50 S. Saparov, C. Nimigean and P. Pohl.**  
Water transport across the KcsA channels.
- 16.50–17.00 M. Ceccarelli, C. Danelon, A. Laio and M. Parrinello.**  
Antibiotic translocation through Ompf channel:  
a molecular dynamics investigation.
- 17.00–17.10 D. Gomez-Varela, F. Barros, CG Vilorio, T. Giraldez, D. G. Manso, S. G. Dupuy,  
P. Miranda and P. de la Peña.**  
A sequence in the proximal domain of HERG K<sup>+</sup> channel amino terminus is  
necessary for regulation by the phospholipase C-coupled TRH receptor
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