

**Program of the International Symposium on Retinal Proteins:
Experiments and Theory, University of Bremen, September 23 – 26, 2007**

Conference site: “House of Science” located in the historical center of Bremen

Each talk should be 30 minutes long, followed by 10 minutes of discussion

Sunday, Sept. 23rd 2007

20:00 Welcome Reception, Town Hall

Monday, Sept. 24th, Day 1

08:30 – 08:45 Welcome from Thomas Frauenheim

Session I: Structure of Visual Rhodopsins

Chairman: Volker Buß

08:45 – 09:25 Gebhard Schertler
Crystal Structure of a Thermally Stable Rhodopsin Mutant

09:25 – 10:05 Georg Büldt
Crystal Structures of the First Steps of the Signalling Pathway of the Phototactic System of an Archaeobacterium

10:05 – 10:45 Midori Murakami
Crystal Structure of Squid Rhodopsin

10:45 – 11:05 Coffee

Session II: Structure of Ion-Pumping Rhodopsins

Chairman: Nicoleta Bondar

11:05 – 11:45 Tsutomu Kouyama
Structures and Dynamics of Archaeal Light-Driven Proton Pumps in 3D Crystals: Effect of Crystal Packing, Lattice Force and Xenon Binding

11:45 – 12:25 György Váró
Direct Observation of the Protein Motion During the Photochemical Reaction Cycle of the Bacteriorhodopsin

12:25 – 14:00 Lunch

Session III: Excited-State Dynamics, Structure of the Batho State

Chairman: Marco Garavelli

14:00 – 14:40 Sergei Balashov
Excitation Energy Transfer from Antenna Carotenoid to Retinal in Xanthorhodopsin

14:40 – 15:20 Richard Mathies
Direct Structural Observation of the Primary Isomerization in Vision with Femtosecond Stimulated Raman

15:20 – 16:00 Valentyn Prokhorenko
Weak-Field Optimal Control of Retinal Isomerization in Bacteriorhodopsin: Experimental Evidences and Theoretical Analysis

16:00 – 16:20 Coffee

- 16:20 – 17:00** Minoru Sugihara
Structures of the Chromophore in Rhodopsin and Bathorhodopsin
- 17:00 – 17:40** Victor Batista
Computational Studies of the Primary Phototransduction Event in Visual Rhodopsin
- 17:40 – 19:30** Poster Session

Tuesday, Sept. 25th; Day 2

Session I: Optical Spectrum of Retinal and the Opsin Shift

Chairman: Marcus Elstner

- 08:30 – 09:10** Lars Andersen
Electronic Spectroscopy of Retinal Chromophore Ions in the Gas Phase
- 09:10 – 09:50** Sivakumar Sekharan
Origin of the Spectral Tuning Mechanisms in Rhodopsin, Bathorhodopsin and Isorhodopsin

Session II: NMR and FTIR Spectroscopy of Rhodopsins

Chairman: Martin Engelhard

- 09:50 – 10:30** Judith Herzfeld
Degrees of Freedom in the Active Site of Bacteriorhodopsin: NMR Probes of the Chromophore and a New Model of Water
- 10:30 – 10:50** Coffee
- 10:50 – 11:30** Leonid Brown
Pathways of Proton Transfer in Fungal and Cyanobacterial Rhodopsins
- 11:30 – 12:10** Friedrich Siebert
FTIR Studies of the Counterion Mutant E113Q of the Visual Pigment Rhodopsin
- 12:10 – 12:50** Janos Lanyi
Bacteriorhodopsin Photocycle at Cryogenic Temperatures Reveals Distributed Barriers of Conformational Substates
- 12:50 – 14:30** Lunch

Session III: Chloride Pumping Rhodopsins

Chairman: Stefan Fischer

- 14:30 – 15:10** Jörg Tittor
The Crystal Structure of the L1 Intermediate of Halorhodopsin
- 15:10 – 15:50** Christoph Pfisterer
Energy Storage and Early Photocycle Events in the Halorhodopsin Anion Pump
- 16:00 –** Guided Town Tour
- 20:00** Conference Dinner

Wednesday, Sept. 26th, Day 3

Session I: Role of Water Molecules in Retinal Proteins Function

Chairman: Matthias Ullmann

- 08:30 – 09:10** Hideki Kandori
The Determinants of Light-Energy and Light-Signal Conversion in Rhodopsins
- 09:10 – 09:50** Klaus Gerwert
The Role of Protein Bound Water Monitored by trFTIR
- 09:50 – 10:10** Coffee

Session II: Proton Transfer I

Chairman: Joachim Heberle

- 10:10 – 10:50** Georg Nagel
Channelrhodopsins and Pumprhodopsins: Characterization and Applications
- 10:50 – 11:30** András Dér
Electric Signals to Reveal Bacteriorhodopsin Function
- 11:30 – 12:10** Matthias Ullmann
The Influence of the Membrane Potential on the Protonation of Bacteriorhodopsin: Insights from Electrostatic Calculations
- 12:10 – 14:00** Lunch

Session III: Proton Transfer II

Chairman: Paul Tavan

- 14:00 – 14:40** Nicoleta Bondar
Directional Pathways in the Proton-Pumping Cycle of Bacteriorhodopsin
- 14:40 – 15:20** Menachem Gutman
Proton Transfer in Non-Homogenous Matrix: Kinetic Measurement and Molecular Dynamics Simulation in Overlapping Time Range
- 15:20 – 16:00** Donald Bashford
Kinetic Modeling of Conformational Change and Proton Transfer in the Bacteriorhodopsin Photocycle
- 16:00 – 16:20** Coffee

Panel Discussions: Past, Present and Future of Simulations and Experiments on Retinal Proteins

Chairman: Thomas Frauenheim, Volker Buß

- 16:20 – 18:30** Menachem Gutman, Akio Maeda *et al.*
- 16:20 – 16:30** Opening
- 16:30 – 16:50** Brief Presentations of the Aspects to be Discussed
- 16:50 – 18:30** Discussions
Closing Remarks by Thomas Frauenheim