

SCIENTIFIC PROGRAM

Monday June 16, 2008

08:50-09:00 Opening remarks

09:00-10:30

Session 1. Structure and function of GPCR

Chair: Najmoutin Abdulaev (Rockville)

- L-1 DECIPHERING MECHANISMS OF GPCR ACTIVATION
Leonardo Pardo (Barcelona)
- L-2 STRUCTURE OF THE BETA ADRENERGIC RECEPTORS: PROGRESS IN OBTAINING
RECOMBINANT G PROTEIN COUPLED RECEPTOR STRUCTURES
Gebhard F X Schertler (Cambridge)
- L-3 CRYSTAL STRUCTURE OF THE HUMAN BETA2 ADRENERGIC RECEPTOR
Søren G.F. Rasmussen (Stanford)

11:00-13:00

Session 2. Bacteriorhodopsin photocycle and transport

Chair: Lajos Keszthelyi (Szeged)

- L-4 LIGHT-TRIGGERED TEMPORARY ALTERATIONS IN PROTEIN DYNAMICS AND CONFORMATION
DRIVE BACTERIORHODOPSIN'S WORKING CYCLE
Norbert A. Dencher (Darmstadt)
- L-5 WHAT DO ELECTRIC SIGNALS TELL US ABOUT BACTERIORHODOPSIN FUNCTION?
András Dér (Szeged)
- L-6 THE PHOTOCYCLE OF BACTERIORHODOPSIN AT CRYOGENIC TEMPERATURES: A TIME-
RESOLVED INFRARED STUDY
Andrei K. Dioumaev (Irvine)
- L-7 ANALYSIS OF PHOTO-INDUCED PROTON UPTAKE/RELEASE BY BACTERIORHODOPSIN AND
PROTEORHODOPSIN USING A SnO₂ TRANSPARENT ELECTRODE
Naoki Kamo (Sapporo)

14:00-15:30 **Posters viewing**

Monday June 16, 2008

15:30-17:30

Session 3. Retinal and water in bacteriorhodopsin

Chair: Georg Bueldt (Jülich)

- L-8 ROLE OF WATER AND RETINAL DYNAMICS IN BACTERIORHODOPSIN PROTON TRANSFER
Ana-Nicoleta Bondar (Irvine)
- L-9 DEGREES OF FREEDOM IN THE ACTIVE SITE OF BACTERIORHODOPSIN: NMR PROBES OF EARLY CHROMOPHORE BEHAVIOR AND A NEW MODEL OF WATER
Judith Herzfeld (Brandies)
- L-10 PROTEIN-BOUND WATERS IN CATALYSIS
Klaus Gerwert (Bochum)
- L-11 WATER DYNAMICS IN BACTERIORHODOPSIN: FTIR STUDY AT LOW- AND ROOM TEMPERATURES
Hideki Kandori (Nagoya)

18:00-20:30

Session 4. Rhodopsin structure and function

Chair: György Váró (Szeged)

- L-12 INACTIVE AND ACTIVE FORMS OF RHODOPSIN
Oliver P. Ernst (Berlin)
- L-13 PROTEIN-LIPID INTERACTIONS IN 3D CRYSTALS OF SQUID RHODOPSIN AND ARCHAEAL RHODOPSINS
Tsutomu Kouyama (Nagoya)
- L-14 INVOLVEMENT OF HELIX 8 IN THE FORMATION OF METARHODOPSIN II
Ulrike Alexiev (Berlin)
- L-15 RHODOPSIN MUTANTS ASSOCIATED WITH RETINAL DISEASES: NEW INSIGHTS INTO THE STRUCTURE AND FUNCTION
Pere Garriga (Terrassa)
- L-16 RHODOPSIN STRUCTURE FUNCTION PATHOLOGY
David T. Lodowski (Ohio)

Tuesday June 17, 2008

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Session 5. Xanthorhodopsin

Chair: Mikio Kataoka (Nara)

- L-17 EXCITATION ENERGY TRANSFER AND RELATIVE ORIENTATION OF RETINAL AND CAROTENOID IN XANTHORHODOPSIN
Sergei P. Balashov (Irvine)
- L-18 STRUCTURAL MODEL OF XANTHORHODOPSIN FROM X-RAY DIFFRACTION AT 1.9 Å RESOLUTION
Janos K. Lanyi (Irvine)
- L-19 WHERE IS THE PROTON RELEASE GROUP?
A COMPARISON OF XANTHORHODOPSIN WITH OTHER MICROBIAL RHODOPSINS
Hartmut Luecke (Irvine)

11:00-13:00

Session 6. Rhodopsins and visual cycle

Chair: Rosalie Crouch (Charleston)

- L-20 FUNCTIONAL DIVERSITY OF ANIMAL RHODOPSINS
Yoshinori Shichida (Kyoto)
- L-21 11-*cis* RETINOL AS A SUBSTRATE FOR CONE PIGMENT REGENERATION AND DARK ADAPTATION
M. Carter Cornwall (Charleston)
- L-22 VISUAL PERCEPTION - MINUS ONE PLUS MINUS ONE CAN EQUAL PLUS ONE
Sivakumar Sekharan (Duisburg)
- L-23 STRUCTURAL DYNAMICS OF ARRESTIN BINDING AND RELEASE – INSIGHTS AND MYSTERIES
David L. Farrens (Portland)

14:00-15:30 **Posters viewing**

Tuesday June 17, 2008

15:30-18:00

Session 7 Activation of rhodopsins

Chair: Akio Maeda (Urbana) and Ernst Bamberg (Frankfurt)

- L-24 EXCITED STATE DYNAMICS OF BOVINE RHODOPSIN RESOLVED VIA MULTICONFIGURATIONAL QUANTUM CHEMISTRY
Massimo Olivucci (Siena)
- L-25 RETINYLIDENE STRUCTURE AND DYNAMICS IN ACTIVATION OF RHODOPSIN AS DETECTED BY SOLID-STATE ²H NMR RELAXATION
Michael F. Brown (Tucson)
- L-26 ACTIVATION SWITCHES OF RHODOPSIN
Reiner Vogel (Freiburg)
- L-27 NMR ANALYSIS OF RHODOPSIN ACTIVATION AND G PROTEIN INTERACTIONS
Kevin D. Ridge (Houston)
- L-28 LOCAL STRUCTURE AND DYNAMICS AT FUNCTIONAL SITES IN ARCHAEAL RHODOPSIN AS REVEALED BY SITE-DIRECTED SOLID-STATE NMR
Akira Naito (Yokohama)

18:30-20:30

Session 8 Advances in microbial rhodopsins

Chair: Motoyuki Tsuda (Hyogo)

- L-29 STRUCTURAL AND FUNCTIONAL SURPRISES FROM NEW MICROBIAL RHODOPSINS
Leonid S. Brown (Guelph)
- L-30 FUNCTIONAL AND SPECTROSCOPIC COMPARISON OF CHANNELRHODOPSINS FROM *CHLAMYDOMONAS* AND *VOLVOX CARTERI*
Peter Hegemann (Berlin)
- L-31 FT-IR MEETS ELECTROPHYSIOLOGY: SURFACE-ENHANCED IR ABSORPTION DIFFERENCE SPECTROSCOPY (SEIDAS) OF SENSORY RHODOPSIN II
Joachim Heberle (Bielefeld)
- L-32 THE MECHANISM BY WHICH RETINAL PROTEINS CATALYZE RETINAL PHOTOCHEMICAL AND THERMAL ISOMERIZATION
Mordechai Sheves (Rehovot)

Wednesday June 18, 2008

09:00-10:30

Session 9. Structures, stability and folding of retinal proteins

Chair: Maarten Heyn (Berlin)

- L-33 MECHANICAL PROPERTIES OF MEMBRANE PROTEINS: POSSIBLE ROLES IN FOLDING AND FUNCTION
K. Tanuj Sapra (Dresden)
- L-34 INSIGHTS INTO THE FOLDING TRANSITION STATE OF AN INTEGRAL MEMBRANE PROTEIN
Paula Booth (Bristol)
- L-35 MODULATION OF RHODOPSIN STRUCTURE AND STABILITY BY SMALL MOLECULE LIGANDS
Judith Klein-Seetharaman (Pittsburgh)

11:00-13:00

Session 10. Photosensor proteins - I

Chair: Johan Lugtenburg (Leiden)

- L-36 HAMP DOMAINS IN SR11: SENSING THE LIGHT
Martin Engelhard (Dortmund)
- L-37 PROTEIN-PROTEIN INTERACTIONS IN SENSORY RHODOPSINS STUDIED BY FTIR SPECTROSCOPY
Yuji Furutani (Nagoya)
- L-38 IS SENSORY RHODOPSIN-I A PROTEORHODOPSIN HOMOLOGUE?
Roberto Bogomolni (Santa Cruz)
- L-39 THE MOLECULAR MECHANISM FOR THE SIGNALING FROM SENSORY RHODOPSINS TO THEIR COGNATE TRANSDUCER PROTEINS
Yuki Sudo (Nagoya)

Thursday June 19, 2008

09:00-10:30

Session 11. Photosensor proteins - II

Chair: Friedrich Siebert (Freiburg)

- L-40 INNER RETINAL AND EXTRARETINAL PHOTORECEPTOR UP-DATES: ISOLATION AND CHARACTERISATION OF VA OPSIN IN *XENOPUS* AND THE CHICKEN
Mark Hankins (Oxford)
- L-41 RHODOPSINS IN CYANOBACTERIA HELP TO SURVIVE BETTER IN NATURE
Kwang-Hwan Jung (Seoul)
- L-42 A SCHIFF BASE CONNECTIVITY SWITCH CONTROLS SENSORY RHODOPSIN SIGNALING
Oleg Sineshchekov (Houston)

11:00-13:00

Session 12. Posters discussion: Bacterial Rhodopsins

Chair, Janos K. Lanyi (Irvine)

MOLECULAR ORIGIN OF THE PROTON-PUMP VECTORIALITY IN BACTERIORHODOPSIN
Víctor A. Lórenz Fonfría and H. Kandori **(P-47)**

FUNCTIONS AND INTERACTIONS OF WATER MOLECULES WITHIN BACTERIORHODOPSIN
Erik Freier, Steffen Wolf, and Klaus Gerwert **(P-22)**

REAL-TIME MONITORING OF MODULATIONS IN THE PROTEIN DYNAMICS DURING THE PHOTOCYCLE OF BACTERIORHODOPSIN BY QUASIELASTIC NEUTRON SCATTERING **(P-30)**
Thomas Hauß, Jörg Pieper, Alexandra Buchsteiner, Ruep E. Lechner, Norbert A. Dencher

ROLE OF PROLINE RESIDUE IN PHARAONIS HALORHODOPSIN: AN FTIR STUDY
Mikihiro Shibata, Yuya Kitade, Yuji Furutani, Makoto Demura and Hideki Kandori **(P-68)**

ROLE OF ARG123 IN LIGHT-DRIVEN ANION PUMP MECHANISMS OF N. PHARAONIS HALORHODOPSIN, NpHR
Megumi Kubo, Takashi Kikukawa, Seiji Miyauchi, Masakatsu Kamiya, Tomoyasu Aizawa, Keiichi Kawano, Naoki Kamo, and Makoto Demura **(P-41)**

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Session 12. (Continued)

INTRODUCTION OF AN UNNATURAL AMINO ACID AS A PHOTOSWITCH IN NpHtrII 1-114

Jörg Sauermann, Marc Dittmann and Martin Engelhard **(P-62)**

CRUCIAL INTERACTIONS OF THE PHOTOTAXIS RECEPTOR SENSORY RHODOPSIN I WITH THE COGNATE TRANSDUCER HTRI **(P-65)**

Ramona Schlesinger, Olga S. Mironova, Ivan L. Budyak, Georg Büldt, and Joachim Heberle

14:00-15:00 **Posters viewing**

15:00-17:00

Session 13. Posters discussion: Rhodopsins and related proteins

Chair, Peter K. Hofmann (Berlin)

HETEROLOGOUS EXPRESSION OF SEVERAL EUKARYOTIC RHODOPSINS IN E.COLI AS A MISTIC FUSION AND GST FUSION PROTEIN

Keon Ah Lee and Kwang-Hwan Jung **(P-43)**

DAILY RHYTHM IN MELANOPSIN EXPRESSING CELLS IN THE MOUSE RETINA

González-Menéndez Irene, Cernuda-Cernuda Rafael, García-Fernández José M. **(P-27)**

E113 IS REQUIRED FOR THE EFFICIENT PHOTOISOMERIZATION IN UV-ABSORBING VISUAL PIGMENTS

Kei TSUTSUI, Hiroo IMAI and Yoshinori SHICHIDA **(P-81)**

PROBING THE ISOMERIZATION MECHANISM OF RETINAL IN RHODOPSIN BY QM/MM MOLECULAR DYNAMICS SIMULATIONS

Igor Schapiro, Gerrit Groenhof, Volker Buss **(P-64)**

PAIRWISE INTERACTIONS BETWEEN THE TRANSMEMBRANE DOMAINS OF THE ADENOSINE A2A RECEPTOR

Tzvetana Lazarova and Damien Thévenin **(P-44)**

TWO RECENT STRUCTURAL ACHIEVEMENTS: THE ACTIVE OPSIN AND THE SQUID RHODOPSIN

Jung Hee Park; Patrick Scheerer; Midori Murakami **(P-1, P-2, P-52)**

17:00

Greetings from the next organizer

Closing