

Detailed DAILY Scientific Programme

(Lectures, discussion, poster sessions and etc.,)

International Conference "Photosynthesis Research for Sustainability"

Baku, Azerbaijan, July 24 -30, 2011

24 July, 2011 (1st day)

Arrival

Registration

15:30 – Opening ceremony

Jalal Aliyev (Azerbaijan), Ali Abbasov (Azerbaijan), Jim Barber (UK), Eva-Mari Aro (Finland), Bill Rutherford (France), Bob Blankenship (USA), Suleyman Allakhverdiev (Russia)

16:00-16:35 (35 min) Plenary Lecture 1

Jim Barber, Imperial Collage London, London, **UK**

“From natural to artificial photosynthesis”

16:35-17:10 (35 min) Plenary Lecture 2

Hiroshi Nishihara, The University of Tokyo, **Japan**

"Photosensing systems composed of phosystem I and molecular wire".

17:10- 17:45 (35 min) Plenary Lecture 3

Seeram Ramakrishna, National University of Singapore, **Singapore**

“Electrospun nanomaterials for energy”

18:00 – Welcome party

25 July (2nd day)

Chairpersons: Jim Barber (UK); Suleyman Allakhverdiev (Russia);

8:30- 9:05 (35 min) Plenary Lecture 4

Jalal A. Aliyev, Research Institute of Crop Husbandry, Ministry of Agriculture of Azerbaijan Republic; Institute of Botany, ANAS, **Azerbaijan**

“Photosynthesis, photorespiration and productivity of wheat and soybean genotypes”

9:05-9:40 (35 min) Plenary Lecture 5

Leslie Dutton, University of Pennsylvania, USA

"Prospects for natural photosynthesis in man-made proteins"

9:40-10:15 (35 min) Plenary Lecture 6

Jian-Ren Shen, Okayama University, Okayama, Japan

"Atomic structure of PSII that enables photosynthetic water-splitting"

10:15-10:35 (20 min) Coffee break

Chairpersons: Jian-Ren Shen (Japan); Bill Rutherford (France-UK)

10:35-11:10 (35 min) Plenary Lecture 7

Nathan Nelson, Tel Aviv University, Israel

"Crystal structure of plant PSI and its utilization as a photovoltaic device"

11:10-11:45 (35 min) Plenary Lecture 8

John Golbeck, The Pennsylvania State University, USA

"Production of solar biofuels using modified biological components"

11:45-12:15 (30 min) Lecture 1

Athina Zouni, (Carina Glöckner), Technical University, Berlin, Germany

"Progress in the structural biology of photosystem II: a closer look at the acceptor side"

12:15-12:45 (30 min) Lecture 2

Ernst-Walter Knapp, Free University of Berlin, Germany

"Exploring redox, protonation states and function of the Mn-cluster in PS II"

12:45-14:30 Lunch

Chairpersons: Norio Murata (Japan); Fabrice Rappaport (France)

14:30-15:05 (35 min) Plenary Lecture 9

Holger Dau, Freie University of Berlin, Berlin, Germany

"Protonation dynamics in photosynthetic water oxidation"

15:05-15:40 (35 min) Plenary Lecture 10

Gernot Renger, Technische Universität Berlin, Germany

"The fundamental role of the redox couple H_2O/O_2 in solar energy exploitation by the biosphere"

15:40-16:10 (30 min) Lecture 3

Jean-David Rochaix, University of Geneva, Switzerland

"Molecular analysis of state transitions"

16:10-16:40 (30 min) Lecture 4

Jun Minagawa, National Institute for Basic Biology, Okazaki, Japan

“A supercomplex of supercomplexes driving cyclic electron flow in photosynthesis”

16:40-17:00 (20 min) Coffee break

Chairpersons: Jun Minagawa (Japan); Gernot Renger (Germany)

17:00- 17:30 (30 min) Lecture 5

Arvi Freiberg, Institute of Physics, University of Tartu, **Estonia**

“Spectroscopic effects associated with self-assembly of photosynthetic antenna proteins into native intracytoplasmic membranes”

17:30-18:00 (30 min) Lecture 6

Marc Brecht, Universitat Tuebingen, Instituts fur Physikalische und Theoretische Chemie, **Germany**

“Single-molecule spectroscopy on PSI and PSI-nano-hybrids”

18:00-18:30 (30 min) Lecture 7

Mahir D. Mamedov, A.N. Belozersky Institute of Physical-Chemical Biology, Moscow State University, **Russia**

“Electrogenic reactions involving PSII turnover”

Chairpersons: Athina Zouni (Germany); Julian Eaton-Rye (New Zealand); Esa Tyystjarvi (Finland); Diana Kirilovsky (France);

18:30-19:30 (60 min) Poster viewing/discussion: Sections 1-6

20:00- Dinner

26 July (3rd day)

Chairpersons: Yuichiro Terashima (Japan); Jean-David Rochaix (Switzerland)

8:30- 9:05 (35 min) Plenary Lecture 11

Norio Murata, Yoshitaka Nishiyama, Suleyman Allakhverdiev, National Institute for Basic Biology, Okazaki, **Japan**

“The mechanism of photoinhibition in vivo: Re-evaluation of previous studies”

9:05-9:40 (35 min) Plenary Lecture 12

Steven Long, University of Illinois at Urbana-Champaign, Urbana, IL, **USA**

“Digital re-design in systems and synthetic biological approaches to improving resource use efficiency in crop photosynthesis”

9:40-10:15 (35 min) Plenary Lecture 13

Mitsue Miyao, National Institute of Agrobiological Sciences (NIAS) Tsukuba, **Japan**

“Lessons from engineering a single-cell C4 photosynthetic pathway into rice: an approach to improve C3 photosynthesis”

10:15-10:45 (30 min) Lecture 8

Anja Krieger-Liszkay, Institut de Biologie et Technologies de Saclay (IBiTec-S), CNRS URA, CEA Saclay, Gif-sur-Yvette, **France**

“Regulation of photosynthetic electron transport and ROS production in plants grown in short day or long day conditions”

10:45-11:00 (20 min) Coffee break

Chairpersons: Norio Murata (Japan); Eva-Mari Aro (Finland)

11:00-11:30 (30 min) Lecture 9

Esa Tyystjarvi, University of Turku, Turku, **Finland**

“Photoinhibition of PS II - magnetic field effect, singlet oxygen and mechanism”

11:30-12:00 (30 min) Lecture 10

Imre Vass, Institute of Plant Biology, Biological Research Center, Szeged, **Hungary**

“Molecular mechanisms of photoinhibition”

12:00-12:30 (30 min) Lecture 11

Igor N. Stadnichuk, Institute of Biochemistry, RAS, **Russia**

“Phycobilisomes in phenomena of short-term light adaptations”

12:30- 13:00 (30 min) Lecture 12

Diana Kirilovsky, iBiTec-S, Gif sur Yvette, **France**

“The orange carotenoid protein and photoprotection: in vitro reconstitution of the photoprotective mechanism”

13:00-14:30 Lunch

Chairpersons: Akiho Yokota (Japan); Nathan Nelson (Israel)

14:30-15:05 (35 min) Plenary Lecture 14

R. Khatypov, A. Khmelnitsky, A. Khristin, Vladimir Shuvalov,
Institute for Basic Biological Problems, **Russia**

“Primary charge separation within P870* in WT and mutants of heterodimers of P in femtosecond time domain”

15:05-15:40 (35 min) Plenary Lecture 15

Miwa Sugiura, Ehime University, Ehime, **Japan**

“Comparison of *Thermosynechococcus elongates* PS II composed of different D1”

15:40-16:10 (30 min) Lecture 13

Andrey B. Rubin, Faculty of Biology, Moscow State University, **Russia**

“Chlorophyll fluorescence and problems of ecological monitoring”

16:10-16:40 (30 min) Lecture 14

Frank Müh, Institut für Theoretische Physik, Johannes Kepler Universität Linz, Linz, **Austria**
“Towards a Structure-based Understanding of Excitation Energy Transfer in Light-Harvesting Complexes”

16:40-17:00 (20 min) Coffee break

Chairpersons: Barry Bruce (USA); Imre Vass (Hungary);

17:00-17:30 (30 min) Lecture 15

Jorg Pieper, University of Tartu, Tartu, **Estonia**

“Protein and hydration water dynamics in photosynthetic pigment-protein complexes”

17:30-18:00 (30 min) Lecture 16

Gyozo Garab, Biological Research Center, HAS, Inst. Plant Physiology, Szeged, **Hungary**

“Fast, reversible membrane-reorganizations in cyanobacterial and algal cells and in isolated plant thylakoid membranes”

18:00-18:30 (30 min) Lecture 17

Ismayil Zulfugarov, Busan National University, **Korea**; Institute of Botany, ANAS, **Azerbaijan**

“Superoxide production in the absence of energy-dependent quenching of chlorophyll fluorescence: The origin and the consequences”

Chairpersons: Anja Krieger-Liszkay (France); Ernest-Walter Knapp (Germany); Marc Brecht (Germany); Anjana Jajoo (India)

18:30-19:30 (60 min) Poster viewing/discussion: Sections 7-13

19:00- Dinner

27 July (4th day) (Lectures, Special Events and Tours)

Chairpersons: Kimiyuki Satoh (Japan); Jian-Ren Shen (Japan)

8:30- 9:05 (35 min) Plenary Lecture 16

Bill Rutherford, iBiTec-S, Gif sur Yvette, **France**

“Photosystem II; an evolutionary view”

9:05-9:40 (35 min) Plenary Lecture 17

Eva-Mari Aro, University of Turku, **Finland**

“Alternative electron transfer routes in thylakoid membranes of chloroplasts and cyanobacteria”

9:40-10:15 (35 min) Plenary Lecture 18

Robert Blankenship, Washington University, **USA**

“Evolution of photosynthesis”

10:15 -10:35 (20 min) Coffee break

**Chairpersons: Jim Barber (UK); Kimiyuki Satoh (Japan);
Suleyman Allakhverdiev (Russia)**

10:35-11:10 (35 min) Plenary Lecture 19

Per E.M. Siegbahn, University of Stockholm, Sweden

“Mechanism and structure for water oxidation based on computations”

11:10-11:40 (30 min) Lecture 18

Fabrice Rappaport, Institut de Biologie Physico-Chimique, CNRS, France

“Reinvestigating the role of short-circuits or alternative electron pathways: exemples from the cytochrome b6f complex and the plastid terminal oxidase”

11:40-12:10 (30 min) Lecture 19

Tatsuya Tomo, Tokyo University of Sciences, Tokyo, Japan

“Current topics of chlorophyll-*d* dominated cyanobacterial photosystems”

12:10-12:40 (30 min) Lecture 20

Franz-Josef Schmitt, Technische Universitat Berlin, Germany

"Excitation energy transfer processes in coupled phycobiliprotein complexes of *A. marina* and semiconductor nanocrystals forming hybrid structures"

12:40-13:10 (30 min) Lecture 21

Min Chen, University of Sydney, Australia

“Expanding the photosynthetic spectrum using red-shifted chlorophylls”

13:10-15:00 Lunch

Chairpersons: Holger Dau (Germany); Per Siegbahn (Sweden)

15:00-15:30 (30 min) Lecture 22

Julian Eaton-Rye, University of Otago, Dunedin, New Zealand

“Photosystem II lipoprotein in cyanobacteria”

15:30- 16:00 (30 min) Lecture 23

Kentaro Ifuku, Graduate School of Biostudies, Kyoto University, Kyoto, Japan

"Functional diversifications of photosystem II extrinsic subunits in higher plants"

16:00-16:30 (30 min) Lecture 24

Marc Nowaczyk, Ruhr-University Bochum, Bochum, Germany

“The role of a novel dimeric photosystem II-Psb27 complex in PSII repair”

17:00

Special Events

1) Young Talents (3 awards/prizes)

2) Best posters (3 awards/prizes)

FREE TIME

28 July (5th day)

Chairpersons: Miyao Mitsue (Japan); Andrey Rubin (Russia)

8:30- 9:05 (35 min) Plenary Lecture 20

Akiho Yokota, Nara Inst. Sci. Technol. (NAIST), Japan

“RuBisCO and Its Challenges”

9:05- 9:40 (35 min) Plenary Lecture 21

Ichiro Terashima, Department of Biological Sciences, The University of Tokyo, Japan

“Chloroplast CO₂ concentration and Rubisco kinetic parameters in the elevated CO₂ world”

9:40-10:15 (35 min) Plenary Lecture 22

Govindjee, University of Illinois, USA

"Photosystem II: Unique role of bicarbonate”

10:15-10:45 (30 min) Lecture 25

Vyacheslav V. Klimov, Institute of Basic Biological Problems, Russia

"Bicarbonate requirement for the water-oxidizing complex of photosystem II"

10:45-11:00 (15 min) Coffee break

Chairpersons: Arvi Freiberg (Estonia); Mahir Mamedov (Russia)

11:00- 11:30 (30 min) Lecture 26

Vidadi M. Yusibov, Fraunhofer USA Center for Molecular Biotechnology, USA;

Institute of Botany, ANAS, Azerbaijan

“Future of plant biotechnology: Industrial and health applications”

11:30-12:00 (30 min) Lecture 27

Anjana Jajoo, Ahilya University, Indore, India

“Low pH causes structural re-organizations in thylakoid membranes of higher plants”

12:00-14:00 Lunch

Chairpersons: Vladimir Shuvalov (Russia); Bob Blankenship (USA)

14:00-14:30 (30 min) Lecture 28

Seiji Akimoto, Molecular Photoscience Reserch Center, Kobe University, Kobe, **Japan**

“Optimization of light harvesting probed by time-resolved spectroscopy”

14:30-15:00 (30 min) Lecture 29

Heiko Lokstein, University of Potsdam, **Germany**

“Non-linear laser spectroscopy of pigment-pigment interactions in light-harvesting complexes”

15:00-15:30 (30 min) Lecture 30

Hazem Kalaji, Warsaw University of Life Science, Warsaw, **Poland**

"Exploring the structure and function of photosynthetic apparatus by the use of simultaneous measurements of prompt and delayed fluorescence and modulated light reflection at 820 nm"

15:30-15:45 (15 min) Coffee break

Chairpersons: Vyacheslav Klimov (Russia); Govindjee (USA)

15:45-16:15 (30 min) Lecture 31

Victor Solovyov, Department of Computer Science, Royal Holloway, London, **UK**

“Plant genomes bioinformatics and new sequencing technologies”

16:15-16:45 (30 min) Lecture 32

Ilham A. Shahmuradov, Institute of Botany, ANAS, **Azerbaijan**

“Bioinformatics approach in studies of plant gene transcription and mRNA polyadenylation”

16:45-17:15 (30 min) Lecture 33

Tarlan H. Mamedov, Fraunhofer USA Center for Molecular Biotechnology, **USA**; Institute of Botany, ANAS, **Azerbaijan**

“Target modification in plants by co-expressing with modifying enzymes”

19:00- Banquet

29 July (6th day)

Chairpersons: John Golbeck (USA); Gyozo Garab (Hungary)

8:30- 9:05 (35 min) Plenary Lecture 23

Barry D. Bruce, Sustainable Energy and Education Research Center (SEERC), University of Tennessee, **USA**

“Strategies for integration of photosynthetic complexes into photovoltaic devices”

9:05-9:35 (30 min) Lecture 34

Olaf Kruse, Bielefeld University, Center for Biotechnology, **Germany**
“Molecular aspects of light to biomass conversion”

9:35-10:05 (30 min) Lecture 35

Anatoliy Tsygankov, Institute of Basic Biological Problems, RAS, Pushchino, **Russia**
“Purple bacteria as hydrogen producers”

10:05-10:35 (30 min) Lecture 36

Harvey J.M. Hou, University of Massachusetts, Dartmouth, **USA**
“Mimicking PS II using Mn-oxo complex/tungsten oxide catalytic material”

10:35-10:50 (15 min) Coffee break

Chairpersons: Olaf Kruse (Germany); Yashar Feyziev (Azerbaijan)

10:50- 11:20 (30 min) Lecture 37

Joanna Grzyb, Institute of Physics, PAS, Warsaw, **Poland**
“De novo designed proteins - modules for photosynthetic systems”

11:20-11:50 (30 min) Lecture 38

Khurram Saleem Joya, Department of Chemistry, Leiden University, **The Netherlands**
“A new class of highly efficient and easy accessible single site molecular water splitting catalysts”

12:00-13:30 Lunch

14:00 closing ceremony

**Jalal Aliyev (Azerbaijan), Jim Barber (UK), Eva-Mari Aro (Finland),
Bill Rutherford (France), Bob Blankenship (USA)**

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30 July (7th day) Departure