

## International Conference on “Photosynthesis Research for Sustainability-2011”, July 24–30, 2011, Baku, Azerbaijan

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**Abstract** In this brief report, we provide a perspective on an international conference “*Photosynthesis Research for Sustainability-2011*”, held in Baku, Azerbaijan, during July 24–30, 2011 (<http://www.photosynthesis2011.cellreg.org/>). At this conference, awards were given to nine young investigators; they are recognized in this *Report*. We have also included here some photographs to show the pleasant ambiance at this conference. (See <http://www.photosynthesis2011.cellreg.org/Photos.php> and <http://www.life.illinois.edu/govindjee/g/Photo/Baku.html> for more photographs taken by the authors as well as by others.) We invite the readers to the next conference on “Photosynthesis Research for

Sustainability-2013” to be held in May or June 2013, in Baku, Azerbaijan. Information will be posted at: <http://www.photosynthesis2013.cellreg.org/>.

**Keywords** Young investigator awardees (Tofig Allahverdiyev, Emine Dinc, Zinaida Eltsova, Vaclav Karlicky, Maria Leonova, Roshan Sharma Poudyal, Junji Uchiyama, Mai Watanabe, Ivelina Zaharieva)

### The Conference

It was a great pleasure for the hosts of the conference on *Photosynthesis Research for Sustainability* to welcome nearly 280 participants from 41 countries in Baku (the capital city of the Azerbaijan Republic). This conference was held during July 24–30, 2011 and was a great occasion for discussions of previous, present, and future research on photosynthesis, from molecular to global aspects of this process (<http://www.photosynthesis2011.cellreg.org/Conference-programme.php>).

Figure 1 shows a photograph of the opening ceremony of the conference, and Fig. 2 shows some of the audience at the opening ceremony.

Figure 3 shows a group photograph of the participants and the organizers, whereas Fig. 4 shows some individual participants at the conference. For other photographs of this conference, see <http://www.photosynthesis2011.cellreg.org/Photos.php> and <http://www.life.illinois.edu/govindjee/g/Photo/Baku.html>.

We had an exiting scientific program, which covered the breadth and depth of photosynthesis, and provided excellent opportunity to meet photosynthesis researchers from around the world. Also this meeting provided a forum for students, postdoctoral fellows and scientists from all over

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This *News Report* is based partly on an Editorial by Suleyman Allakhverdiev in *Biochimica et Biophysica Acta* and in the *International Journal of Hydrogen Energy* (in press, 2012), where the papers presented at the Baku conference on “*Photosynthesis Research for Sustainability*” will be published. This *News Report*, as presented here, was read and approved for publication by James (Jim) Barber, Chairman of the International Committee of this conference.

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**Fig. 1** Opening ceremony of the conference Photosynthesis Research for Sustainability-2001, Baku, Azerbaijan, July 24–30, 2011. Place: The main building of the Azerbaijan National Academy of Sciences, Baku, Azerbaijan. *Left to right* Suleyman Allakhverdiev (Coordinator of the meeting); Jalal Aliyev (Honorary Chairman); James (Jim)

Barber (Chairman, Past President of the International Society of Photosynthesis Research, ISPR); Ali Abbasov (Chairman of the local organizing committee, Minister of Communication and Information Technology of the Republic of Azerbaijan); and William (Bill) Rutherford (Current President of the ISPR)



**Fig. 2** Audience at the opening ceremony. Place: The main building of Azerbaijan National Academy of Sciences, Baku

the world to deepen their knowledge and understanding, widen professional contacts, and create new opportunities, including establishing new collaborations.

The two organizing committees, international and local, are listed at: <http://www.photosynthesis2011.cellreg.org/>

[Organizing-committee.php](#)>. The first author (SIA) of this *News Report* was the coordinator of this conference; the second author (IMH) was a member of the local organizing committee, and the third author (Govindjee) was a member of the international organizing committee. We specifically



**Fig. 3** A group photograph of some of the participants at the conference on the grounds of the Crescent Beach Hotel



**Fig. 4** Some of the participants caught off guard. *Top Left* Eva-Mari Aro (*right*) with her husband Heikki Ilmari Aro. *Top Right* Min Chen (*left*) and Kimiyuki Satoh (*right*). *Bottom Left* Govindjee (2nd from *left*) and James (Jim) Barber (4th from *left*), with Vaclav Karlicky

(*extreme left*), Aleksandra Janina Orzechowska (*middle*) and Karolina Agnieszka Bosa (*extreme right*). *Bottom Right* Elvin Suleymanoglu Allakhverdiev (a 13-year-old participant) with Gernot Renger

mention that Jalal A. Aliyev was the Honorary Chairman; T. Nejat Veziroglu (President of International Association for Hydrogen Energy), and Gary Brudvig were

Co-Chairmen; and James (Jim) Barber was Chairman of the International Committee, whereas Ali Abbasov was Chairman of the local organizing committee.

This exciting international conference covered all the important aspects of photosynthesis, especially their relationship to global issues as well as hydrogen production and artificial photosynthesis. Topics included Type I and Type II photosynthetic reaction centers; photosynthetic electron flow and photophosphorylation; mechanism of water oxidation; photosynthetic light harvesting; C3, C4, and CAM (Crasulacean Acid Metabolism) photosyntheses; regulation of photosynthetic gene expression; biogenesis of photosynthetic apparatus; photosynthesis, and environmental stress; artificial photosynthesis; photosynthetic and biomimetic hydrogen production; photosynthesis in relation to crop and biomass productivity; photosynthesis education; and bioinformatics of photosynthesis.

There were *sixty-three* speakers (listed alphabetically; in some cases, nicknames are given): Ali Abbasov, Jalal Aliyev, Suleyman Allakhverdiev, Seiji Akimoto, Eva-Mari Aro, Jim Barber, Marc Brecht, Robert (Bob) Blankenship, Barry Bruce, Min Chen, Holger Dau, Leslie (Les) Dutton, Julian Eaton-Rye, Arvi Freiberg, Gyozo Garab, Carina Glöckner, John Golbeck, Govindjee, Joanna Grzyb, Kentaro Ifuku, Anjana Jajoo, Khurram Saleem Joya, Hazem Kalaji, Diana Kirilovsky, Vyacheslav (Slava) Klimov, Ernst-Walter Knapp, Anja Krieger-Liszkay, Olaf Kruse, Steven (Steve) Long, Heiko Lokstein, Mahir Mamedov, Tarlan Mamedov, Mitsue Miyao, Jun Minagawa, Norio Murata, Frank Müh, Nathan Nelson, Hiroshi Nishihara, Marc Nowaczyk, Jorg Pieper, Seeram Ramakrishna, Fabrice Rappaport, Gernot Renger, Jean-David Rochaix, Andrei B. Rubin, William (Bill) Rutherford, Franz-Josef Schmitt, Ilham Shahmuradov, Jian-Ren Shen, Vladimir Shuvalov, Per Siegbahn, Victor Solovyov, Igor Stadnichuk, Miwa Sugiura, Ichiro Terashima, Tatsuya Tomo, Anatoliy Tsygankov, Esa Tyystjarvi, Imre Vass, Athina Zouni, Ismayil Zulfugarov, Akiho Yokota, and Vidadi Yusibov). In addition, we had about 90 posters, presented by both established and young scientists from 41 countries: Australia, Austria, Azerbaijan, Belarus, Bulgaria, Canada, China, Czech Republic, Denmark, Estonia, Finland, France, Germany, Hungary, India, Iran, Israel, Japan, Jordan, Kazakhstan, Korea, Latvia, Mongolia, Nepal, New Zealand, Pakistan, Poland, Roumania (Romania), Russia, Singapore, Slovakia, Spain, Sweden, Switzerland, Syria, Tajikistan, Turkey, The Netherlands, UK, Ukraine, and USA.

Most of the talks at this conference dealt with the state-of-the-art research, starting with a brief review of the current knowledge and the relevance of the topic to global issues, followed by a balanced presentation of the latest research results, concluding with views on the future course of research including the outstanding global issues and challenges facing us all. Further, the chairpersons emphasized the key points of the talks, steered the discussions by providing additional thoughts, and introduced related ideas.

The conference dinner was elegant and sumptuous; it also included great music and dancing. Figure 5 shows some of the photos taken there.

We did have some time for sightseeing, walking, and exchanging thoughts with others. Figure 6 gives a glimpse of this activity.

## Young researchers

### The selection process

This conference enabled organizers to select nine awardees from among the young researchers who presented their research at this conference. The awards/prizes were presented to these researchers who had done and presented outstanding research in the field of “photosynthesis for sustainability”. These young researchers included Ph.D. students as well as post-docs. The chairpersons of poster viewing and discussion were Athina Zouni (Germany), Julian Eaton-Rye (New Zealand), Esa Tyystjarvi (Finland), Diana Kirilovsky (France), Tatsuya Tomo (Japan), Anja Krieger-Liszkay (France), Ernest-Walter Knapp (Germany), Marc Brecht (Germany), and Anjana Jajoo (India), who selected and nominated the names of young researchers for the awards. Then the winners were selected by another committee: Jim Barber (Chairman of the conference, and Past President of the International Society of Photosynthesis Research (ISPR), from UK); Jalal Aliyev (Honorary Chairman of the conference, Azerbaijan); Suleyman Allakhverdiev (Coordinator of the conference, Russia); William (Bill) Rutherford (President of the ISPR, France-UK); Eva-Mari Aro (another Past President of the ISPR, Finland); Hiroshi Nishihara (Japan); and Seeram Ramakrishna (Singapore).

### The awardees

The following received either monetary awards or book awards for their outstanding research. They were (alphabetically)

- *Tofiq Allahverdiyev* (Research Institute of Crop Husbandry, Ministry of Agriculture of Azerbaijan Republic, Baku, Azerbaijan). *Title of research*: Effect of soil water deficit on gas exchange parameters, relative water content and assimilating surface area of leaves from bread wheat genotypes.
- *Emine Dinc* (Institute of Plant Biology, Biological Research Center, Hungarian Academy of Science, Szeged, Hungary). *Title of research*: Application of synthetic antisense oligo deoxy-nucleotides in higher plants.
- *Zinaida Eltsova* (Institute of Basic Biological Problems, Russian Academy of Science, Pushchino,



**Fig. 5** Conference dinner and dance. *Top Left* Conference participants dancing with a famous singer of Azerbaijan, Fidan Hajiyeva. *Top Right (Left to right)* William (Bill) Rutherford; Ali Abbasov; Govindjee (standing); and James (Jim) Barber. *Middle Left* Dancers and the audience. *Middle Right* Min Chen; Imre Vass; and Julian

Eaton-Rye. *Bottom Left* Robert (Bob) Blankenship; in the background: Sudeyif Imamverdiyev, Asaf Hajiyev, and William (Bill) Rutherford at the conference dinner. *Bottom Right (Left to right)* Vyascheslav (Slava) Klimov, Vladimir (Volodya) Paschenko, Andrei Rubin, and Vladimir (Vlad) Shuvalov

Moscow Region, Russia). *Title of research:* Purple bacteria mutants with low pigment content: do they have higher potential as hydrogen producers?

- *Vaclav Karlicky* (Department of Biophysics, Faculty of Science, Palacký University, Czech Republic). *Title of research:* The acclimation of the photosynthetic apparatus to different intensity of PAR (Photosynthetic Active Radiation).
- *Maria Leonova* (Institute of Basic Biological Problems, RAS, Pushchino, Moscow Region, Russia). *Title of research:* Electron transfer in *Rhodobacter sphaeroides* mutant reaction centers in the absence of the monomer bacteriochlorophyll molecule B<sub>A</sub>.

- *Roshan Sharma Poudyal* (Department of Molecular Biology, Pusan National University, Korea). *Title of research:* Impairment of Photosystem II repair and accumulation of reactive oxygen species in STN8 kinase knock-out rice mutants.
- *Junji Uchiyama* (Research Center for RNA Science, RIST, Tokyo University of Science, Noda, Japan). *Title of research:* The Sph two component signal transduction pathway of *Synechocystis* sp. PCC 6803 regulates transcription of the gene specifying acid stress-inducible protein Slr0967 and Slr0939.
- *Mai Watanabe* (Department of Life Sciences (Biology), Graduate School of Arts and Science, University



**Fig. 6** Some of the participants visiting Baku. *Top Left* Our outstanding sight-seeing guide, a historian, with Esa Tyystjarvi, Hazem Kalaji, and others. *Top Right* Irada Huseynova (*left*) with Samira Rustamova. *Bottom Left* Athina Zouni (3rd from *left*), Rajni

Govindjee (4th from *left*) with two young researchers (Carina Rebecca Glöckner and Julia Hellmich). *Bottom Right* Andrei Rubin (2nd from *left*) with three young investigators (Vaclav Karlicky, Leyla Abasova, and Alexandr Shitov)

of Tokyo, Tokyo, Japan). *Title of research:* Photosystem I specific phycobilisome in *Anabaena sp. PCC 7120*.

- *Ivelina Zaharieva* (Frei Universität Berlin, Institute für Experimental Physik, Berlin, Germany). *Title of research:* A novel electrodeposited Mn film mimicking the Mn cluster in Photosystem II as an efficient catalyst for water oxidation.

Figure 7 (left) shows Jim Barber presenting a monetary award to one of the awardees (Mai Watanabe); photographs of others are available at the web sites mentioned earlier. Figure 7 (right) shows Govindjee presenting one of the books (from *Advances in Photosynthesis and Respiration Series*) to Ivelina Zaharieva. (For the most recent book in this Series, see: <http://www.springerlink.com/content/978-94-007-1579-0#section=982000&page=1>; its front matter can be downloaded free).

In addition, posters of the Z-scheme of electron transport from water to nicotinamide adenine dinucleotide phosphate, NADP<sup>+</sup> (which had been designed by Govindjee and Wilbert (Bill) Veit) and copies of a book *Music of Sunlight* were given to young researchers at the conference (courtesy of Bill Veit). Further, the

organizing committee, mostly the local committee, provided financial support to many researchers attending this conference.

### Concluding remarks

We end this *News Report* by paying special Tribute to Jalal Aliyev for his pioneering contributions to the growth and support of Science in Azerbaijan, especially to this conference. Figure 8 (left) shows him with Les Dutton, and Figure 8 (right) with Govindjee.

In a recent e-mail to Govindjee, Jalal Aliyev wrote “It was nice to meet you and your wife here in Baku. I remember our talk with great pleasure. I hope you liked your stay in our country. I hope to see you again in Baku in the near future! My warmest regards to you and Mrs. Rajni Govindjee.” Let us all plan to meet in Baku, Azerbaijan (<http://www.photosynthesis2013.cellreg.org/>) before we all meet in St. Louis, Missouri, during August 11–16, 2013, for the 16th International Congress on Photosynthesis Research <http://biology4.wustl.edu/ps2013/index.html> (co-chaired by Robert Blankenship and Donald R. Ort).



**Fig. 7** Young investigator awardees (see text for all the names). *Left* James (Jim) Barber presenting a monetary award to Mai Watanabe. *Right* Govindjee presenting a book award to Ivelina Zaharieva



**Fig. 8** Expression of thanks to Jalal Aliyev. *Left* P. Leslie (Les) Dutton and Jalal Aliyev, with others. *Right* Govindjee, Jalal Aliyev, Asaf Hajiyev, and Tarlan Mamedov

Appendix 1 shows a selection of some of the messages received by one of the authors (SIA).

The 2011 conference on photosynthesis in Baku provided leading and up-and-coming researchers an opportunity to present the latest developments in our field; it provided a wonderful environment for socializing with colleagues both old and new. Many attendees happily await the next conference in 2013, in the same place, in the same Hotel, and in the same city. We hope to see everyone at the next conference. We wish all success to the persons who will serve as the chairman and the co-chairman, of both the international and local committees at the next conference “Photosynthesis Research for Sustainability-2013” to be held in May or June, 2013, in Baku, Azerbaijan.

**Acknowledgments** We express our appreciation to all the attendees for valuable discussions on various aspects of photosynthesis at the

Baku conference. We thank all the members of the *International organizing committee* for their help with the various sections, and the committees, mentioned in this report for the selection of the Awardees; further, we are grateful to all the chairpersons of the poster sessions for their help; and thank all the sponsors: The Ministry of Communications and Information Technologies of Azerbaijan Republic; State Oil Company of Azerbaijan Republic; The Ministry of Ecology and Natural Resources of Azerbaijan Republic; Azerbaijan National Academy of Sciences; Institute of Botany of Azerbaijan National Academy of Sciences; International Society of Photosynthesis Research (ISPR); Hansatech Instruments: Instrumentation for Photosynthesis and Respiration Studies; and Agrisera—Antibodies for Plant Sciences; We also thank the International Association for Hydrogen Energy (IAHE), and the local organizers for providing funds for the awards given to young investigators; and Jacco Flipsen (and Ineke Ravesloot) of Springer, for mailing books to Yashar Feyziev (in Baku) for awards for the best posters. Govindjee thanks Brandon Flowers for his help with the photo plates, and Yashar Feyziev and Karim Gasimov for their help in Baku.

### Appendix 1: A selection of messages received by one of the authors (SIA) and the national organizing committee

Several messages were received after the conference. Some are listed below, alphabetically, by last name; we selected only one message from one country; our apologies to those whose messages could not be included.

- *Jim Barber (UK)*: “You did a fantastic job and it was, indeed, a very successful conference enjoyed by all. Thank you very much. We enjoyed our visit to Baku and hope to return in 2013”.
- *Bob Blankenship (USA)*: “I thank you for such a great job of organizing the conference in Baku. It was really an unforgettable time. ....Thank you again for all the time and concern that you gave me for my visa and during the conference.”
- *Arvi and Niina Freiberg (Estonia)*: “Thank you very much for the high level, and well organized conference, and wonderful hospitality. We had a great time in Azerbaijan”.
- *Gyöző Garab (Hungary)*: “Thanks for all your hospitality and bringing us together, also for the nice photos....”
- *Anjana Jajoo (India)*: “You must be relaxing after months of non-stop work. I heartily congratulate you for organizing such a great event. It was a very successful conference. You (and your team) deserve applause from everyone who attended it.”
- *Khurram Saleem Joya (The Netherlands)*: “I thank you for organizing such a great conference. It was really a nice meeting and for a young researcher like me, there was a lot to learn. Also the Baku city is very nice and it was beautiful to visit various places in Baku.”
- *Norio Murata (Japan)*: “Thank you very much for the nice conference. It was an excellent meeting full of important information. I really enjoyed it. Thank you again. Dishes in Azerbaijan were very nice. In particular, all Japanese participants said the same. You selected a nice hotel, which had nice comfortable rooms and nice restaurants. You must have been very exhausted after the conference. I understand you were paying the greatest effort during and before the conference to make it so successful. It was very successful. All participants said the same.”
- *Gernot Renger (Germany)*: “I thank you again for all of your efforts to make the conference in Baku very successful and at the same time very pleasant.”
- *Jean-David Rochaix (Switzerland)*: “I wish to thank you again and to congratulate you for putting up such a splendid and successful meeting in such a beautiful environment. Please thank your staff for all their efforts to make our stay so enjoyable.”
- *Imre Vass (Hungary)*: “It was a nice meeting. I enjoyed the conference, and really it was very good meeting. I thank you again for the kind support.”