

Final Report

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Title: Conference Support, 23rd Western Photosynthesis Conference 2014

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A. Meeting Description and Summary:

The Western Photosynthesis Conference is a regional conference that is held on an annual basis to bring together researchers primarily from the Western United States to share their newest research advances on photosynthetic processes. The 23rd conference was focused on both fundamental and more applied research on the biological conversion of solar energy to various energy storage forms. Several particular areas of solar energy conversion were emphasized in this conference (see below). Some of these topics, such as carbon limitations on photosynthesis, biomimicry and phenotyping, have traditionally not been incorporated extensively in the Western Photosynthesis Conference. We found that these topics have substantially broadened the scope of this meeting.

This conference was held on Jan. 2 – 5, 2014 in Pacific Grove, CA at the Asilomar Conference Grounds. The head organizer was myself (Dr. Rebekka Wachter), the outgoing Assistant Organizer Dr. Arthur Grossman (Carnegie Institution, Stanford), and the incoming Assistant Organizer Dr. Helmut Kirchhoff (Washington State University). The Financial Officer continues to be Dr. Kevin Redding (ASU) and the web site and conference program booklet were prepared by Larry Orr (Manager, Center for Bioenergy and Photosynthesis, Arizona State University).

The conference schedule consisted of six sessions:

1. Photosynthetic Carbon Fixation and Biofuel Production
2. Genomics, Metabolic Networks and Photo-Acclimation
3. Redox Regulation of Photosynthetic Processes
4. Photosystems and Reaction Centers
5. Membrane Architecture and Photoprotection
6. Artificial Photosynthesis

Summary of Presentations: The schedule included two Keynote Presentations by Bob Buchanan (UC Berkeley) and Melvin Y. Okamura (UC San Diego). In addition, ten invited speaker presentations were held (David Hanson, U. of New Mexico; Cheryl Kerfeld, UC Berkeley; Sabeeha Merchant, UC Los Angeles; J. Clark Lagarias, UC Davis; David Knaff, Texas Technical University; James P. Allen, Arizona State University; W.E. Moerner, Stanford; Devens Gust, Arizona State University; Giovanna Ghirlanda, Arizona State University; and Jenny Y. Yang, UC Irvine). In addition to invited presentations, oral presentations were chosen from submitted abstracts, and a total of 35 talks were given by Masters and doctoral students, postdocs and other junior research scientists. Two-hour poster sessions were held on two consecutive days, and about 40 posters were on display.

2. Description of Invited Presentations

Invited talks by **David T. Hanson** (University of New Mexico) and **Cheryl Kerfeld** (UC Berkeley) focused on CO₂ limitations of net photosynthesis in relation to various carbon concentration mechanisms that have evolved in plants and cyanobacteria. In this area, the invited **Keynote Speaker** was **Bob B. Buchanan** (UC Berkeley; member, National Academy of Sciences), who discovered the regulatory role of thioredoxins 45 years ago, and could be called "the father of thioredoxins". Invited speakers **David B. Knaff** (Texas Tech U.) and **J. Clark Lagarias** (UC Davis; member, National Academy of Sciences) presented on the topic of two-cysteine-mediated use of photosynthetic redox equivalents in key biological processes. Invited speaker **Sabeeha Merchant** (UC Los Angeles; member, National Academy of

Sciences) presented on the topic of using the green alga *Chlamydomonas* as a model organism in photosynthesis. Invited speaker **Devens Gust** (ASU) introduced the concept of using a systems approach to artificial photosynthesis by incorporating functional modules dedicated to water splitting and hydrogen production, all interfaced by various materials. An invited talk was given on peptide-based mimics of hydrogenases by **G. Ghirlanda**, ASU. The theme was extended to water splitting by invited speaker **James Allen** (ASU), who presented his work on interfacing manganese complexes with Photosystem I and on incorporating dimanganese sites into artificial proteins. In addition, invited speaker and Assistant Professor **Jenny Y. Yang** (UC Irvine) discussed her work on inorganic coordination complexes as catalysts to carry out redox reactions useful in the production and utilization of chemical fuels. In combination, all these approaches are of fundamental importance in devising novel, efficient means for the generation of energy-dense materials, with the ultimate goal of finding sustainable ways to power the planet. Invited speaker **Helmut Kirchhoff** (Washington State University) discussed thylakoid membrane ultrastructure and supramolecular organization. A critical part of this particular session consisted of a **historical retrospective on photosynthetic reaction centers**. Enormous contributions to our understanding of reaction center function have been made by Lou Duysens, George Feher and Rod Clayton. A plenary lecture was given by our **Keynote Speaker Mel Okamura** (US San Diego), who presented the pioneering contributions of George Feher to this research area.

2. Awards.

The Malkin Award for best postdoc oral presentation was given to Rikard Fristedt at UCLA, the Beverly Green Award for best graduate student oral presentation to Robert Calderon, UC Berkeley; a Poster Award was presented to Daniel Jun, University of British Columbia Vancouver; and the second poster award was presented to Alexandra Krawicz, UC Berkeley; the best Undergraduate oral presentation award was presented to Timothy Woodiwiss, Washington State University; and best undergraduate poster award was presented to Amber Bassett, University of Tennessee.

3. Student, post-doctoral and assistant professor travel awards

To encourage attendance and participation by junior researchers, financial support for travel to and from the meeting were provided for a series of students and postdoctoral researchers. In addition one Assistant Professor, as detailed in the Table below.

	email	Affiliation	Travel Receipts submitted	Refund through MPS0346
Jenny Yang	j.yang@uci.edu	UC Irvine	160.- registration 714.59 lodging	715.-
Meng Li	mli19@utk.edu	University of Tennessee	374.10	367.-
Prakitchaimr Chotewutmontri	pchotewu@utk.edu	University of Tennessee	482.10	367.-
Ryan Knoerdel	ryan.knoerdel@email.wsu.edu	Washington State University	865.-	368.-
Timothy Woodiwiss	timothy.woodiwiss@email.wsu.edu	Washington State University	(979 miles) 436.-	368.-
Trevor Kashey	tkashey@asu.edu	ASU	314.80	315.-
Total			3,347.-	2,500.-