



Harvesting Light, the Single-Molecule Way

Work at Stanford that is Uncovering Molecular Mechanism of Light Harvesting in Living Systems May Illuminate Path Forward to Future Solar Cells

EMBARGOED until 11:15 a.m. Pacific Time on Sunday, February 16, 2014

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WASHINGTON D.C. Feb. 16, 2014 -- New insights into one of the molecular mechanisms behind light harvesting, the process that enables photosynthetic organisms to thrive, even as weather conditions change from full sunlight to deep cloud cover, will be presented at the 58th Annual Biophysical Society Meeting, taking place in San Francisco from Feb. 15-19.

At the meeting, Hsiang-Yu Yang, a graduate student, and Gabriela Schlau-Cohen, a postdoc in W.E. Moerner's research group at Stanford University, will describe how probing these natural systems at the single molecule level is helping to understand the basic mechanisms of light harvesting -- work that could help improve the design and efficiency of devices like solar cells in the future.

"Through our approach, we are able to have a better understanding of the natural designs of light harvesting systems, especially how the same molecular machinery can perform efficient light harvesting at low light while safely dissipating excess excitation energy at high light," explained Yang.

The Moerner group has been studying various photosynthetic antenna proteins using the single-molecule Anti-Brownian Electrokinetic (ABEL) trap and has uncovered new states of the light harvesting complexes with different degrees of quenching. "By analyzing the transition between these states in a bacterial antenna protein," explained Schlau-Cohen, "we found a process that may be one of the molecular mechanisms of photoprotection, or the way in which the organism protects itself from damage by excess light."

The next steps are to use this technique to understand the natural designs of harvesting systems, and investigate whether the same processes appear in higher plants. Thus, they are extending their studies to look at photosynthetic proteins from green plants. Eventually, understanding these general principles may help in developing or improving the building of artificial light-harvesting devices.

The presentation, "Elucidation of the Photodynamics of Single Photosynthetic LH2 Complexes in Solution" by Gabriela S. Schlau-Cohen,

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Quan Wang, June Southall, Richard J. Cogdell and W. E. Moerner will be at 11:15 a.m. on Sunday, February 16, 2014 in Room 303 at San Francisco's Moscone Convention Center. ABSTRACT: <http://tinyurl.com/nbgca5v>

The related presentation, "Single-molecule Exploration of the Photodynamics of LHCII Complexes in Solution" by Gabriela S. Schlau-Cohen, Hsiang-Yu Yang, Michal Gwizdala, Tjaart Krüger, Pengqi Xu, Roberta Croce, Rienk van Grondelle and W. E. Moerner will be at 1:45 p.m. on Sunday, February 16, 2014 in Hall D in San Francisco's Moscone Convention Center. ABSTRACT: <http://tinyurl.com/p8g32wm>

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ABOUT THE MEETING

The Biophysical Society Annual Meeting is the largest meeting of biophysicists in the world, and each year, it brings together thousands of researchers working in many different multidisciplinary fields. Some 4,513 abstracts were submitted for the 2014 meeting, and more than 7,000 attendees will attend from all 50 U.S. states and another 58 countries. The meeting will feature 500 speakers, more than 850 poster presentations per day, 23 symposia and five workshops. There will also be 211 exhibits from 162 different companies. Despite its size, the meeting retains its small-meeting flavor through its subgroup symposia, platform sessions, social activities, and committee programs.

QUICK LINKS

Main Meeting Page: <http://tinyurl.com/mfjh37p>

Abstracts Search: <http://tinyurl.com/lbrearu>

MEETING HIGHLIGHTS

Future of Biophysics Symposium: <http://tinyurl.com/ponx4ck>

New and Notable Symposium: <http://tinyurl.com/klv3jht>

ABOUT THE SOCIETY

The Biophysical Society, founded in 1958, is a professional, scientific Society established to encourage development and dissemination of knowledge in biophysics. The Society promotes growth in this expanding field through its annual meeting, monthly journal, and committee and outreach activities. Its 9000 members are located throughout the U.S. and the world, where they teach and conduct research in colleges, universities, laboratories, government agencies, and industry. For more information on the Society, or the 2014 Annual Meeting, visit www.biophysics.org