

# ASP NEWS



Winter 2014

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## Note from the Editorial Committee

This winter has been a memorable for those experiencing the record low temperatures brought about by the polar vortex. But this is all the more reason to look forward to warmer times ahead at the upcoming ASP meeting in June in San Diego! The line-up is absolutely fantastic, with Nobel Laureate Roger Tsien just confirmed as a speaker.

In this issue of the newsletter, we will start a short “meet a photobiologist” section to present short interviews with past and present members of the ASP. Who better to start this feature with than the current ASP president, Beth Gaillard!

We also have job opportunities listed and we hope that can become a regular practice.

I remind all ASP members that any member-generated content is always welcome for inclusion in the newsletter.

-Jonathan Lovell

## Meet a Photobiologist:

*Beth Gaillard, President of ASP*



*Education:* 1984, B.S., The Florida State University. 1990, Ph.D., The University of Texas at Austin

*Training:* Center for Fast Kinetics Research (The University of Texas at Austin), 1991-1993. Center for Photoinduced Charge Transfer (University of Rochester, NY), 1994-1996

## Questions & Answers

**Q:**When I was in high school, I wanted to be:  
**A:** *An MD*

**Q:** A good book I have read is:  
**A:** *The Name of the Rose*

**Q:** I enjoy listening to:  
**A:** *The Gulf of Mexico waves hitting the shore*

**Q:** A good day begins with:  
**A:** *My cats waking me up*

**Q:**What area of photobiology do you work in?

**A:** Vision research. My interests are in the biochemistry of retinal diseases, biophysical studies of lens proteins and development of imaging/diagnostic techniques for eye diseases. My group has recently been involved in developing delivery methods for ophthalmic drugs.

**Q:** How did you first get interested in science?

**A:** I have loved math and science since I was a child. My father was a pilot and taught me about math and science. I did undergraduate research at Florida State University in Jack Saltiel's group in the area of organic photochemistry and was (still am) fascinated. I went to the University of Texas at Austin to study for PhD in Marye Ann Fox's group. I did most of my research at the Center for Fast Kinetics Research, a NIH Research Resource that had at the time the cutting edge of laser based time resolved spectroscopy and radiation chemistry. Mike Rodgers, ASP president 1993-1994, was the Director of CFKR when I was there. The members of the CFKR user group were working on biological problems so I met many ASP members there. I did post-doctoral work at CFKR on the photochemistry of age related pigments that accumulate in the retina.

**Q:** What do you enjoy about being in the ASP?

**A:** Being exposed to so many different areas of research that are unified by "light and life". ASP is the original multidisciplinary society.

**Q:** What is some good advice you could give to scientists who are just starting out?

**A:** Build a strong network of peers and also more senior scientists who can act as mentors to you, get your name out there, be selective about who joins your research group.

**Q:** What is the secret to being a successful scientist?

**A:** Being able to identify an interesting problem and being willing to learn something new to address it.

***Beth Gaillard is President of ASP and a Professor in the Department of Chemistry and Biochemistry at Northern Illinois University. We reached her by email.***



**We need YOU!**

Please submit content (science highlights, suggested links, personal stories, etc) to the ASP News.  
Email: [jflovell@buffalo.edu](mailto:jflovell@buffalo.edu)

## **Sunlight May Lower Blood Pressure**

Exposing skin to sunlight may help to reduce blood pressure and thus cut the risk of heart attack and stroke, a study published in the Journal of Investigative Dermatology suggests.

Research carried out at the Universities of Southampton and Edinburgh shows that sunlight alters levels of the small messenger molecule, nitric oxide (NO) in the skin and blood, reducing blood pressure.

Martin Feelisch, Professor of Experimental Medicine and Integrative Biology at the University of Southampton, comments: "NO along with its breakdown products, known to be abundant in skin, is involved in the

regulation of blood pressure. When exposed to sunlight, small amounts of NO are transferred from the skin to the circulation, lowering blood vessel tone; as blood pressure drops, so does the risk of heart attack and stroke.”

While limiting sunlight exposure is important to prevent skin cancer, the authors of the study, including Dr Richard Weller of the University of Edinburgh, suggest that minimising exposure may be disadvantageous by increasing the risk of prevalent conditions related to cardiovascular disease.

Cardiovascular disease, often associated with high blood pressure, accounts for 30 per cent of deaths globally each year. Blood pressure and cardiovascular disease are known to vary according to season and latitude, with higher levels observed in winter and in countries further from the equator, where ultraviolet radiation from the sun is lower.

During the study, the skin of 24 healthy individuals was exposed to ultraviolet (UVA) light from tanning lamps for two sessions of 20 minutes each. In one session, the volunteers were exposed to both the UVA rays and the heat of the lamps. In another, the UV rays were blocked so that only the heat of the lamps affected the skin.

The results suggest that UVA exposure dilates blood vessels, significantly lowers blood pressure, and alters NO metabolite levels in the circulation, without changing vitamin D levels. Further experiments indicate that pre-formed stores of NO in the upper skin layers are involved in mediating these effects. The data are consistent with the seasonal variation of blood pressure and cardiovascular risk at temperate latitudes.

Professor Feelisch adds: “These results are significant to the ongoing debate about potential health benefits of sunlight and the role of Vitamin D in this process. It may be an opportune time to reassess the risks and benefits of sunlight for human health and to take a fresh look at current public health advice. Avoiding excess sunlight exposure is critical to prevent skin cancer, but not being exposed to it at all, out of fear or as a result of a certain lifestyle, could increase the risk of cardiovascular disease. Perhaps with the exception of bone health, the effects of oral vitamin D supplementation have been disappointing.

“We believe that NO from the skin is an important, so far overlooked contributor to cardiovascular health. In future studies we intend to test whether the effects hold true in a more chronic setting and identify new nutritional strategies targeted at maximizing the skin’s ability to store NO and deliver it to the circulation more efficiently.”

-source: University of Southampton





**Historian's Corner:  
Flashback to Atlanta, 1996**

The 1996 meeting of ASP took place in Atlanta, in the OMNI hotel, with Nick Geacintov as Scientific Program Chair. This hotel adjoins the main operations of CNN, permitting otherwise unoccupied visitors to explore the operations of Cable Network News. The meeting included a Workshop on methods for measurement of UV radiation led by Donald Forbes, Tom Coohill organized another Workshop on effects of solar UV on aquatic micro-organisms and there were symposia on sunlight, photodynamic therapy, photosynthesis mechanisms, reactive oxygen species, sun screens, photosynthesis, melanin, and lasers.

A special symposium was dedicated to Michael Kasha on the occasion of his 75th birthday. Oliver Sacks once reported that he sometimes provided a gift of element 80 (mercury) to friends who had reached their 80th birthday, but I find no evidence of a presentation of any rhenium at this Symposium. If people want to consider this

idea, I suggest ending any such presentations at bismuth (83) since everything beyond that number is radioactive, e.g., No. 84 is polonium.

Kasha was a member of both the American Academy of Arts and Sciences, and the National Academy of Sciences. In addition to his stellar career in spectroscopy, Kasha designed and patented improvements in acoustic guitars and other string instruments [see <http://www.jthbass.com/kasha.html>. He died in April 2013 after a remarkable career: the Symposium Lecture by Mostafa El-Sayed (Georgia Institute of Technology) referred to Prof. Kasha as a "Renaissance Man", for which there is ample evidence.

A few choice photographs illustrate the status of some of our more prominent members in 1996 as insets onto a scene showing a CNN Q and A session in the atrium of CNN Center. This was a time when the NIH and other agencies were supporting scientific endeavors to a much greater extent than is currently the case. As often can be said of the past, we didn't know how good we had it.

-David Kessel

## Photosynthesis-Activating Protein Likely Predates Oxygen on Earth

A team of researchers has discovered that a regulatory process that turns on photosynthesis in plants at daybreak likely developed on Earth in ancient microbes 2.5 billion years ago, long before oxygen became available.

The research opens new scientific areas in the fields of evolutionary biology and microbiology. The work also has broad societal implications as it allows scientists to better understand the production of natural gas, and it sheds light on climate change, agriculture, and human health.

The findings were described in the journal the Proceedings of the National Academy of Sciences. This research concerns methane-forming archaea, a group of methane-producing microbes known as methanogens that live in areas of nature where oxygen is absent. Methane is the main component of natural gas as well as a potent greenhouse gas.

Methanogens play a key role in nature, most notably in carbon cycling. When plants die, some of their biomass is trapped in areas that are devoid of oxygen such as the bottom of lakes. Methanogens are critical in converting the residual biological material to methane, which other organisms convert to carbon dioxide — a product that can be used by plants. This natural process for producing methane forms the basis for treating municipal and industrial wastes. These processes are beneficial both in reducing pollution and in producing methane that can be trapped and used as a fuel. The same process allows natural gas production from agricultural residues, a renewable resource.

To begin their study, the team investigated an ancient type of methanogen, *Methanocaldococcus jannaschii*, which lives in deep-sea hydrothermal vents or volcanoes where environmental conditions mimic those that existed on the early Earth. They found that the protein thioredoxin, which plays a major role in contemporary photosynthesis, could repair many of the organism's proteins damaged by oxygen.

Since methanogens developed before oxygen appeared on earth, the evidence raises the possibility that thioredoxin-based metabolic regulation could have come into play for managing anaerobic life long before the advent of oxygen.

-source: VirginiaTech

## Employment Opportunities

### SENIOR SCIENTIST-PHOTOBIOLOGIST

In Skillman, New Jersey

Johnson & Johnson Consumer Products Company Division of Johnson & Johnson Consumer Companies, Inc. is hiring a Senior Scientist. The Senior Scientist will be responsible for conducting research directed toward discovery and/or development of new technologies in the Sun Innovation Platform. Read more: <http://bit.ly/1e6LBW1>

Contact: Lauren Myers-Marion,  
[lmyersma@its.jnj.com](mailto:lmyersma@its.jnj.com)

## **ASP NEWS**

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## Upcoming Photobiology Events



**Apr 14-17, 2014**

SPIE Photonics Europe 2014

Brussels, Belgium

Web site: [www.spie.org/x12290.xml](http://www.spie.org/x12290.xml)

**Apr 15-17, 2014**

NIWA UV Workshop

Auckland, New Zealand

Web site:

[www.niwa.co.nz/atmosphere/uvozone/  
uv-science-workshops/2014-uv-workshop](http://www.niwa.co.nz/atmosphere/uvozone/uv-science-workshops/2014-uv-workshop)



**June 14-18, 2014**

**ASP Biennial Meeting**

**Hard Rock Hotel, San Diego CA**

**REGISTER NOW:**

[www.photobiology.org](http://www.photobiology.org)

**Aug 10-14, 2014**

22<sup>nd</sup> IUPAC International Conference on  
Physical

Organic Chemistry

Ottawa (Canada)

Web site:

[events.science.uottawa.ca/icpoc22/welcom  
e.html](http://events.science.uottawa.ca/icpoc22/welcome.html)

**Sep 8-12, 2014**

16<sup>th</sup> International Congress on Photobiology  
Universidad Nacional de Cordoba  
(Argentina)

Web site: [www.photobiology2014.com.ar](http://www.photobiology2014.com.ar)

### **Other Event Calendars**

SPIE Events: [spie.org/x1375.xml](http://spie.org/x1375.xml)

Plant Biology Events: [aspb.org/calendar](http://aspb.org/calendar)

Chemistry Events: [www.chemistry.org](http://www.chemistry.org)

Gordon Research Conferences:

[www.grc.org](http://www.grc.org)

Nature Events Directory:

[www.nature.com/natureevents/science](http://www.nature.com/natureevents/science)



# 37<sup>th</sup> Meeting of The American Society for Photobiology (ASP 2014)

[www.photobiology.org](http://www.photobiology.org)



June 14–19, 2014

Hard Rock Hotel, San Diego, California

<b>Chair:</b> Tayyaba Hasan PhD Massachusetts General Hospital Harvard Medical School Boston, MA, USA	<b>Organizing Committee:</b>	David Mitchell, PhD Univ. Texas, USA	Theresa Busch, PhD Univ. Pennsylvania, USA	Jean Cadet, PhD CEA, France
		Wolfgang Gaertner, PhD Max-Planck-Institute, Germany	Alexander Greer, PhD CUNY-BC, USA	Yu-Ying He, PhD Univ. Chicago, USA
		Edward Maytin, MD, PhD Cleveland Clinic, USA	David Kessel, PhD Wayne State, USA	Jonathan Lovell, PhD Univ. Buffalo, USA
		Theo Theodossiou, PhD The Radium Hospital, Norway	Patrycja N-Sliwiska, PhD EPFL, Switzerland	Imran Rizvi, PhD Harvard Univ., USA
		Dr. rer. nat. Rüdiger Greiner, Elbekliniken Buxtehude, Germany	Henry Lim, MD Henry Ford Health System, USA	John Streicher, MS EPA, USA
		Pål Selbo, PhD The Radium Hospital, Norway		



**Enjoy San Diego Attractions: Gaslight District, Sea  
Food, SeaWorld and the Famous San Diego Zoo**

## Topics include

Light and Biology in Extreme Environments  
Magnetic Field Effects and Photochemistry  
Angiogenesis and Vascular Biology  
Artificial Tanning: Risks and Benefits  
Cellular Modulation in Photobiology  
Enabling Photobiology in the Dark  
DNA Damage and Repair  
Optomechanical Effects  
Stem Cell Photobiology  
Photodynamic Therapy  
Spiders, Silk and Light  
Nanotechnology  
UV-epigenetics  
Tumor models  
Optogenetics

## Networking Events

Mentoring Lunch  
Posters and Prizes  
ASP-ESP Symposium  
San Diego Tours and outing  
NIH Grant Writing Workshop  
Associate Member Travel Awards  
Awards, Banquet, Reception