ASPB News

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Welcome to Chicago! Plant Biology & Botany 2007—A Historic Event

Dear ASPB Member,

Some scientific events are memorable and others capture the imagination, but only a few—like ASPB's 2007 annual meeting—are truly historic. Indeed, it will be my great pleasure to welcome many of you this July to the Plant Biology & Botany 2007 Joint Congress in Chicago—the first time in more than eight decades that ASPB will hold its plant biology conference with the Botanical Society of America (as well as with the American Society of Plant Taxonomists and the American Fern Society). In just a few weeks, 2,500 plant scientists from around the world—one of the largest gatherings of plant scientists ever—will have the opportunity to meet and engage their colleagues in a dynamic and stimulating environment that will nevertheless allow time for relaxed social interactions. And in Chicago, to boot!

At the Chicago congress, young scientists will be able to focus attention on their future careers, beginning with our first-ever laboratory leadership workshop for postdocs and junior faculty (see http://www.aspb.org/meetings/pb-2007/labmanagement.cfm). The meeting will also feature a pair of career workshops organized by the ASPB Women in Plant Biology Committee and extensive networking opportunities for graduate students, postdocs, and others. The development of the next generation of plant scientists will be highlighted through workshops for K–12 educators, who will have the opportunity to attend sessions on Saturday.

We realize that some of you, for a variety of reasons, have opted to spend those several days in early July engaged in other pursuits. Although we would have liked to see you in Chicago and will certainly miss your presence there, we understand and respect that decision, particularly because whether or not you are present, the scholarship that unfolds at the annual meeting necessarily depends on the contributions of all of you to the field.

So whether I can shake your hand in Chicago, invite you to participate vicariously by reading summaries of the meeting in the *ASPB News* (or viewing a podcast or two), or simply share an e-mail or a phone call, I look forward to an exchange. ASPB relishes the opportunity to bring together and highlight the contributions you all make. And because some of us won't meet this year, we hope to see you at our meetings in Mérida, Mexico (June 27–July 2, 2008), and Honolulu (July 18–22, 2009), both of which promise to be memorable—even historic—events.

Cheers,

Crispin Taylor, PhD
Executive Director, ASPB

The *ASPB News* is delivered online as well as in print. Members will be alerted by e-mail when a new issue is posted. The *ASPB News* welcomes member feedback. Contact the editor at nancyw@aspb.org.

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ASPB News

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Mid-Atlantic Section Meeting

On an unseasonably cold spring day in April, more than 60 ASPB members in the Mid-Atlantic Section (MAS) gathered in the Nyumburu Cultural Center on the campus of the University of Maryland at College Park. The full-day program of the MAS–ASPB spring meeting highlighted diverse research topics and extraordinary research accomplishments by plant biologists in the area, including Maryland, Virginia, Delaware, Pennsylvania, and West Virginia. The meeting participants also enjoyed a lively presentation by keynote speaker Mike Blatt from the University of Glasgow titled "Getting Around the Guard Cell—An Expanding Problem." At the end of the meeting, the Marsho awards were announced. Grant Marshall from Jon Monroe's lab at James Madison University and Mandy Reading from Caren Chang's lab at the University of Maryland were chosen for presenting the best undergraduate and graduate talk, respectively. In addition, members discussed section business and listened to updates by ASPB Executive Director Crispin Taylor and Public Affairs Director Brian Hyps.

Zhongchi Liu
Section Chair of MAS–ASPB

ASPB members Gerry Deitzer (left) and Jon Monroe (center) discussed plant research issues with keynote speaker Mike Blatt (right) at the ASPB Mid-Atlantic Section spring meeting.

Midwest Section Meeting

The annual meeting of the Midwest Section of ASPB was held at Michigan State University on March 24–25, organized by Susanne Hoffman-Benning and Colleen Doherty, both from MSU. More than 140 people attended the conference from throughout the Midwest, and 69 abstracts were submitted. Mike Thomashow, past president of ASPB, welcomed students to the meeting, and Richard Sayre, president of the Midwest Section, discussed recent funding opportunities for the plant sciences in biofuels and international agricultural development. Crispin Taylor, executive director of ASPB, presented an overview of ASPB and its young scientist career engagement activities. The plenary lecture, by Dan Voytas from Iowa State University, was titled "Plant Genome Modification Through Homologous Recombination" and discussed the use of zinc-finger nucleases for high-frequency homologous recombination in plants and the zinc-finger nuclease consortium (www.zincfingers.org).

It was generally agreed that the student presentations were among the best in recent years. Awards for best graduate student oral presentations went to Andrea Braeutigam, Eliana Gonzales-Vigil, and Nicola Harrison-Lowe; for best graduate student poster to Yungjing Wang and Colleen Doherty; for best undergraduate oral presentation to R. Ryan McNally and Brandon Wojcik; and for best undergraduate poster to Joyce Bower. Abstracts of the presentations are posted on the Midwest Section website (http://www.aspb.org/sections/midwestern/mw07mtg.cfm).

This year the position of secretary is open for nominations. Sarah Wyatt from Ohio University was nominated for secretary at the meeting; additional nominations are sought from the membership, and a vote will take place in a few months. Next year's officers are Susanne Hoffman-Benning, president, and Chris Wolverton, vice president. Next year's meeting will be held at Iowa State University and will be hosted by Gustavo McIntosh.

Richard T. Sayre
Past President, MW–ASPB

Pictured above are some of the awardees. Front row from left: Ryan McNally, Nicola Harrison-Lowe, Yungjing Wang, and Eliana Gonzales-Vigil. Back row from left: Brandon Wojcik, Andrea Braeutigam, and Colleen Doherty. Not shown: Joyce Bower.

Event Highlight Updates!

The March/April 2007 issue of the ASPB News *featured an extensive preview of the upcoming Joint Congress in Chicago. Here are some updates.*

Perspectives of Science Leaders

(Saturday evening)

Plant Biology into the 21st Century: Where to from Here?

James Collins, assistant director of biological sciences at the National Science Foundation and winner of the ASPB Leadership in Science Public Service Award, will discuss his perspectives on where biology is today, where it is going, and how plant biology fits into that vision.

Career Workshop I: Where Are the Jobs?

(Saturday evening)

Speakers from industry (Christine Ellis, Monsanto; Katherine Krolikowski, Mendel), publishing (Nan Eckardt, *The Plant Cell,* ASPB; Jennifer Henry, *Functional Plant Biology,* CSIRO), academia (Rob Last, Michigan State University), science policy (Diane Jofuku Okamuro, National Science Foundation), and career guidance (Sarah Blackford, Society for Experimental Biology) will give brief presentations about opportunities in their fields and answer questions during the evening. The workshop will begin with dinner. This event requires a pre-purchased ticket.

Career Workshop II: Getting the Most Out of the Postdoc Experience

(Saturday evening)

This new workshop from the Women in Plant Biology Committee has been organized in response to numerous requests. Speakers will discuss postdoc options in industry and academia (Terry Delaney, University of Vermont), postdoc funding (Sharman O'Neill, UC Davis; Guntram Bauer, Human Frontiers Science Program), research/teaching balance (Sarah Wyatt, Ohio University; Leeann Thornton, Washington University), choosing a mentor and project (Nicole Donofrio, University of Delaware), and what PIs look for in a postdoc (Don Ort, University of Illinois). The workshop will begin with dinner. This event requires a pre-purchased ticket.

TAIR/Gramene/SGN Workshop I: Gene Ontology and Plant Metabolic Databases

(Sunday evening)

Speakers

Chih-Wei Tung and Pankaj Jaiswal (Gramene); Tanya Berardini and Hartmut Foerster (TAIR)

This workshop is divided into two parts. **Part I** will focus on describing both the Gene Ontology (GO; http://www.geneontology.org) and Plant Ontology (PO; http://www.plantontology.org) projects. The GO project has developed three structured controlled vocabularies (ontologies) that describe gene products in terms of their associated biological processes, cellular components, and molecular functions in a species-independent manner. Similarly, the PO project has developed an ontology aiming to describe plant anatomic structures and developmental stages. In addition to explaining the concepts behind GO and PO and their development, speakers will demonstrate how they are used for the annotation of gene products across various databases (NCBI, TAIR, AmiGO, etc.) to help researchers find genes and phenotypes in several species that cause similar alterations to functions and phenotype.

Part II will provide an overview of MetaCyc, a non-species-specific, curated biochemical pathway database. Speakers will present MetaCyc's content and explain how to query the database to retrieve information on pathways, enzymes, and genes. They will also show how MetaCyc can be used to generate species-specific metabolic databases by presenting two such databases—AraCyc *(Arabidopsis thaliana)* and RiceCyc *(Oryza sativa)*—and demonstrate how they can be utilized for data integration and classification of high-throughput data such as microarray or metabolomics experiments.

All-Societies Opening Mixer

(Sunday evening)

Open to all meeting registrants, this welcoming event in the Exhibit Hall is a perfect way to reconnect with old friends, meet new people, and network with other meeting participants.

Women in Plant Biology Committee–Sponsored Speaker and Luncheon

(Monday afternoon)

The Women Don't Need Fixing: The Role of Institutions in Advancing the Participation of Women in Science

Speaker

Jo Handelsman, Department of Plant Pathology at the University of Wisconsin–Madison

This annual luncheon is sponsored by the ASPB Women in Plant Biology Committee for meeting attendees. In addition to her work on the structure and function of microbial communities, Handelsman teaches and writes extensively on science education and the status of women in science. Come and enjoy excellent food, network with fellow students and professionals, meet members of the Women in Plant Biology Committee, and hear from one of today's leading women in science.

TAIR/Gramene/SGN Workshop II: Introduction to Three Plant Databases: Gramene, SGN, and TAIR

(Tuesday evening)

Speakers

Pankaj Jaiswal (Gramene); Naama Menda and Lukas Mueller (SGN); Christophe Tissier (TAIR)

This workshop provides an introduction to three plant databases: Gramene (grasses), SGN (Solanaceae), and TAIR (Arabidopsis).

The Gramene Database (http://www.gramene.org) is a comparative mapping

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resource for grasses and other model plants such as Arabidopsis. It leverages the use of sequenced genomes of rice, Arabidopsis, and maize (currently being sequenced) as an anchor for understanding the biology of plant development, metabolic pathways, functional annotation of genes, genetic maps and markers, QTLs, and genetic diversity. During the workshop, forward and reverse genetic examples will be used to query the database for finding candidate genes, their functions, or the genomics region(s) that express the phenotype of interest.

The SGN Database (http://sgn.cornell.edu) is a clade-oriented database (COD) for the Solanaceae, including tomato, potato, pepper, eggplant, and petunia, and closely related species such as coffee. The SGN presentation will feature an overview of database content and available tools. Specifically, the sequence database, the gene family database, the interactive comparative mapviewer, the tomato genome project resources, the locus database, and the phenotype database will be discussed. For tools, a focus will be mapping related tools such as the intron detector and CAPS designer tools.

The TAIR Database (http://www.arabidopsis.org) is a global resource for the *Arabidopsis thaliana* research community. It maintains the complete genome sequence and, among other information, gene structure, gene product information, metabolism, gene expression, DNA, and seed stocks. This workshop is designed for people who are infrequent or new users of the database. We will cover the basics such as registration and ordering, simple searching, and a general orientation about the content of the database.

Workshops (times vary)
A slate of complimentary workshops are planned for the conference and are open to all conference attendees.

For more details and updates, see http://www.aspb.org/meetings/pb-2007/.

2006 Membership Campaign Winners

ASPB thanks all members who participated in 2006 Membership Campaigns. Below are the lucky winners.


Bernhard Huchzermeyer

Renew by December 1, 2006, Winners

Free Year of Membership - G. Ballance
iPOD - Bernhard Huchzermeyer
iPOD Nano - Jen Sheen

Get 6 in '06 Membership Campaign

Recruited six or more members in 2006 and received $50 Amazon Gift Certificates

Surinder Chopra
Colleen Doherty


Surinder Chopra

Grand Prize Drawing Winner of Round-Trip Airfare (up to $800) and Registration to Plant Biology 2007 in Chicago

Surinder Chopra


Colleen Doherty

Second-Place Drawing Winners of an iPOD

Anireddy S. N. Reddy
Senthil Subramanian
Malcolm M. Campbell

Third-Place Drawing Winners of a Plant Biology 2006 T-Shirt

Martin Parniske
Avinash Srivastava
Chih-Wen Yu
Akiko Harada
Clint Chapple
Jane Geisler-Lee
Owen Hoekenga
Ulrich Hammes
Jian Hua
David Still


Senthil Subramanian

Hola from Mérida!

In 2008, ASPB will hold its annual meeting in the historical Mexican city of Mérida. In planning for the meeting, we visited Mérida this past March. It is a wonderful place to experience, and in this article we provide a glimpse of this extraordinary location.

Flights into Mérida from the United States transfer from major southern airports such as Atlanta, Houston, and Mexico City. We flew through Atlanta, and although we switched gates for the international leg, planning a little extra connection time allowed us to grab a bite to eat. For individuals coming from outside the United States, we recommend flying directly into an airport in Mexico rather than through a U.S. airport to avoid having to get a visa for both the United States and Mexico.

On the first evening of our trip, we enjoyed dinner at the Hacienda Xcanatun (*xcanatun* means "tall stone house" in Mayan; http://www.xcanatun.com) and drove through the suburbs of Mérida, filled with small gardens in which exotic local fruits are grown. The hotel is picturesque, with high stucco ceilings, fans creating a warm breeze, and lush tropical gardens. Hacienda Xcanatun was built in the 18th century and eventually became one of the most important producers of *henequen* (a fiber used to produce rope) in the region. We were served its traditional "welcome drink," a frozen lime margarita made with the local "bumpy" limes and *Xtabentun,* a sweet liqueur of anise and honey that is used in many mixed drinks in the Yucatan.

The second day, we toured the excellent group of hotels our attendees will be using for the meeting. The Fiesta Americana and the Hyatt are across the street from each other, and the rest of the hotels are within walking distance of those two. The convention center Yucatan Siglo XXI is somewhat separate from the city—not uncommon in many convention centers outside the United States. Attendees will hop on a bus for a short ride to the convention center. The center itself is a light and airy building that will be a perfect location for our sessions.

Fun events will include a true Mexican fiesta in the street the hotels share, catered by the hotel chefs. We were able to experience the hotel fare throughout the day and were treated to wonderful dishes, including traditional Yucatan lime soup and a mix of Italian, French, and American tastes as well. That evening, we dined out with local plant biologist Theresa Hernandez Sotomayor, enjoying an excellent meal with interesting dishes and desserts.

On our third day, we went on an adventure across the Yucatan and back to visit sites that ASPB members can enjoy on their free day during the meeting. Our first stop was Celestun to see the pink flamingos (http://www.yucatantoday.com/destinations/eng-celestun.htm). The drive itself was amazing. We drove through small Mayan towns, passing orchards and local farms. At Celestun, we contracted a small motorboat and guide and drove up the *ria* (estuary), which is surrounded by magnolia groves and fished by local fisherman throughout the day. As we approached the river bend, a mile-long line of pink flamingos came into view. We got close enough to them to enjoy their magnificence in the thousands. Boating back, our guide took us into the grove, fed by the freshwater springs Valdiosera and Venecia, and through the hauntingly beautiful Tampeten "petrified forest" of dead tree trunks rooted in the water. Celestun is an excellent place for bird watching. What an amazing experience!

Although we don't recommend doing both in the same day, after a three-hour drive back across the Yucatan we arrived in the ancient Mayan city Chichen Itza (http://www.yucatantoday.com/destinations/eng-chichen-itza.php). Our guide took us through each ruin, explaining it significance. Guides are available at the entrance, or you can take a pamphlet with you to read along the way. The 1,500-year-old location itself is a book on Mayan culture. The energy of the famous El Castillo pyramid is incredible. During the solstice celebration, the position of the sun in the sky causes a phenomenon that creates the shadow of a snake along each edge of the pyramid. We walked through the ball court, where a game called *pok ta pok* was played. The number seven is significant in the game, and if you stand in the court and clap your hands, it will echo seven times. More charming than the stories are the local residents selling their wares along the paths, including hand-sewn hankies to wipe your brow. Chichen Itza is a treasure well worth the visit.

Mérida is filled with kind people, deep history, warm culture, delectable food, and lovely landscapes. We hope you will experience it with us June 27–July 2, 2008.

Rosenberg & Sahli
Plant Biology 2008 Meeting Planners
http://www.aspb.org/pb-2008

Postcards from Sarah

ASPB's 2005 AAAS Mass Media Fellow Sarah Nell Davidson is sending a series of "postcards" back to the ASPB News *as she spends the current academic year abroad doing research for her PhD thesis.*

Above: Tony Bacic (far right) speaking to an African journalist in the University of Melbourne booth at the Science Journalists meeting. Photo by Mark Coulson.

Members Meet the Press at the World Conference of Science Journalists

The sunny, hip, and fashionable city of Melbourne not only is home to the manufacturers of the Australian food icon Vegemite and to the company that finally delivered to the world true blue carnations, but also has become the biotech hub of Australia over the past decade, a movement that has likely been fostered by the network of leading universities and plant research centers located in the region.

When more than 600 journalists from around the world gathered for the 5th World Conference of Science Journalists, it was not surprising that the latest in plant genomics and the challenges of agriculture in Australia were on the agenda.

ASPB member and renowned plant cell wall powerhouse Tony Bacic was among the Melbourne-based plant scientists who took the opportunity to mingle with journalists and help them understand the implications of their research programs. Bacic is currently director of the Plant Cell Biology Research Center housed within the School of Botany at the University of Melbourne, which was originally founded in 1982 under the leadership of ASPB member Adrienne Clarke. In addition, Bacic is a research leader at the Australian Centre for Plant Functional Genomics, which is applying basic research to improve the abiotic stress tolerance and grain quality of wheat and barley for Australian farmers.

As a monitoring editor for *Plant Physiology,* Bacic clearly understands the importance of getting the results of research to press. But increasingly, he's recognizing the importance of pushing science beyond an academic readership to the popular press. "I think that as a student, I never appreciated the importance of communicating the science outside of my field, and basically we weren't trained to do that," Bacic confessed during the Melbourne meeting. But according to Bacic, times have changed.

While at the meeting, Bacic talked with several journalists from African and European countries about the implications of his research. Among other topics, they discussed the challenges of abiotic stress in the context of Australia's current drought and listened to one German journalist's impassioned sermon in favor of genetically modified organisms (GMOs). "In most cases, they were asking about how this science can translate into products for their own countries," Bacic said. "Journalists from developing countries want to know if we are working on crops that can be grown back at home."

Bacic reckons that his appreciation for communicating science to broader audiences is due in part to the influence of his longtime colleague, ASPB member Adrienne Clarke, who has become a major spokesperson for science in Australia. "Certainly in this country, she has really talked about science in a way that few others have. She has engaged with government and really gone out to the general public to explain the importance of science," Bacic said.

"We scientists have always taken for granted our understanding that research is so important to the future of our technologies, that why shouldn't we assume that it will automatically be accepted by the public and

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From the Farm to the Laboratory: A Winding Road to Plant Biology

by Peggy G. Lemaux
Department of Plant and Microbial Biology, University of California at Berkeley

It was snowing, cold. And then the water pipes froze, forcing us to head to the outhouse—something I tried to avoid, particularly in the winter! Growing up on a farm in the Midwest was not an easy life. Hours spent bending down to pick strawberries to sell at our roadside stand; cleaning out the chicken coop, breathing in the dusty, fetid air; getting up with the rooster's crow to feed the baby lambs whose mothers had abandoned them. Never a dull moment!

I finished high school and headed off to college, looking to the future and happy to leave the farm and its memories behind. Acting on the advice of my high school counselor—who was afraid that a woman's intellect was not strong enough to survive the rigors of a career in mathematics—I began a career in home economics! At least I learned how to cook, a talent I didn't have time to cultivate on the farm. But after three semesters, my mind yearned for more rigor in my studies. I switched my major to microbiology. Peering in a microscope and seeing life smaller than I could see with my naked eyes was glorious to me! I thrived.

I got a master's degree in microbiology and immunology at the University of Michigan Medical School, followed by a soul-searching period working at a pharmaceutical company and trying to decide if I had what it took to get a PhD. I would be the first in my family. But I remembered my high school counselor's warnings: Was my intellect too weak?

But I grew weary of having others determine the direction of my research and going off to meetings to present my research. I summoned up my courage and headed off to graduate school—again in microbiology, again at the University of Michigan Medical School. In five years I had my degree and went off to the Stanford Medical School to join Stanley Cohen and learn genetic engineering, the powers of which his laboratory had just demonstrated. I used what I learned to manipulate antibiotic-producing *Streptomycetes,* to try to be the first to isolate the interferon gene, and to clone genes from the hepatitis B virus to develop a vaccine.

Interesting it was! But I still didn't feel fulfilled. Was it the memories of growing up on a farm that were tugging at me? Would shifting my focus calm my restless spirit? On a sunny spring day, I wandered over to the Carnegie Institution, Department of Plant Biology on the Stanford campus, and my life changed! I spent time there studying light harvesting in algae and then took a job at DeKalb Plant Genetics, where I really learned plant biology. I focused all of my efforts on figuring out how to apply the genetic engineering technologies I had learned at Stanford to one of the most important crops in the world—corn. We were the first to publish on how to introduce a new gene into corn and observe its passage to the next generation.

Today, perhaps, achieving that goal seems trivial, but to me the excitement of that moment can't be overstated. At the time, there were people who said it couldn't be done—that there were basic biological hurdles that could never be overcome in corn. But we succeeded, a small group of dedicated scientists. And that achievement has spawned an entire industry—not to mention hundreds of thousands of acres of genetically engineered corn worldwide.

Although I had no formal training in plant biology, my goal was to move to an academic institution and make the technically complex process of genetically engineering cereal crops simple. I wanted it to be so routine that undergraduate students could use it to answer basic biological questions, as well as to improve crops.

An unusual opportunity presented itself—a Cooperative Extension position at the University of California at Berkeley in the Department of Plant Biology. Although my view of Cooperative Extension was shaped by my experiences on the farm—contacting the local agent to find out what was causing smut on our corn or fluffy mold on the grapes in our arbor—I decided to apply. I was intrigued, because this job required both developing an applied research program and interacting with the public to explain the genetic engineering of crops. It seemed both interesting and challenging. And it was—in ways that I didn't imagine in 1991 when I took the job.

At that time, there was ample funding to do applied research in cereal crops, and although there were occasional rumblings from consumers about genetically engineered foods (e.g., bGH-injected cows), life was good! Then in the late 1990s, mad cow disease erupted in Europe, and consumers in the European Union became wary of genetically engineered foods. Concern spread to the United States after Charles Margulis, a Greenpeace genetic engineering issues expert, sent a letter to Gerber warning of the dangers of using genetically engineered products in baby food. And then came 9/11 and the war in Iraq. All of these events had a negative impact on plant biology research, and money to do research became hard to secure. Voices of opposition became louder. It was job security for me in one sense, but sadly, applied research aimed at genetic engineering of cereals became a reality difficult to achieve.

Knowing all the difficulties, would I change my career decision? Absolutely not! I love the challenges. I love the triumphs. Never a dull moment! Plant biology was the fulfillment I was seeking. It makes it easy to get up in the morning—even without a rooster crowing!

The Bioethics Imperative XXIX

Snowballs! Cases Made Worse by Subsequent Actions

"Mokita": The truth we all know and **agree** not to talk about. *Papua New Guinea*

In a conversation in Washington, DC, in January 2007, James Kroll, head administrator for the National Science Foundation (NSF) Office of Inspector General (OIG), used the term "snowball" for cases that became worse once the OIG began to investigate an allegation. He was kind enough to relay to me some examples of this type of case.

Case 1. An allegation of fraud was self-disclosed by a university supported by NSF funds. This university found that one of its grants managers had embezzled $500,000, a large portion of which came from NSF grants. The administrator had embezzled the funds by cutting honorarium and stipend checks in his wife's name and cashing them at a local credit union. The NSF OIG concurred with the university's conclusion, and the employee was prosecuted locally and sentenced to four years in jail.

As part of NSF's investigation, the OIG asked the university how it had arrived at the dollar amount of NSF funds the administrator had embezzled, because the university's documentation did not support that figure. As the OIG looked further into the university's management of NSF grants, they found gross inconsistencies in the documentation supporting claimed costs. This problem was compounded by a lack of documentation for alleged cost sharing associated with these grants. Each time NSF asked the university for further documentation, the final expense numbers changed. After an extensive investigation, the university admitted that they did not have adequate documentation to substantiate most of the costs on these grants.

After a lengthy period of negotiation, the university agreed to settle the matter. In total, $3.3 million was either refunded to the U.S. Treasury or "put to better use" (i.e., "deobligated" and reapportioned to new awards) by NSF.

Case 2. NSF OIG received an allegation of plagiarism in an NSF proposal. Analysis revealed approximately a paragraph of allegedly plagiarized text. Normally, this would not be enough to warrant a full-fledged investigation and would result in a warning. However, in comparing the source document with the proposal, NSF investigators found a pair of figures in both documents that looked similar. Further analysis revealed that the principal investigator (PI) had copied the data figures from the source document, altered them slightly, and included them in his own proposal. However, he went one step further in his proposal and described these data in a way that suggested that the data were preliminary results generated in his laboratory. In addition, the description of the altered data was completely different from the description in the source document.

Finally, both on his CV and in his proposal, the PI referenced two manuscripts that were "in submission" to a professional journal. Wanting to determine if the PI had submitted the altered data as part of the manuscripts, NSF instead found that the manuscripts had never been submitted to the journal.

On the basis of the evidence, NSF debarred the subject for two years for falsification of data and plagiarism.

Next time: "Snowballs!" continued—two more cases.

Dina Mandoli
mandoli@u.washington.edu

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viewed as important by them as well. But the reality of it is that it isn't that straightforward," Bacic said. "The GMO debate and a few others have made us realize that no matter how good the product is that you are trying to sell, if you haven't taken the public along with you, it may not amount to much."

"And so increasingly, and largely because of Adrienne's influence, we've became aware of the power of the press, in both positive and negative respects, and also realized that the ability to communicate science effectively even to your colleagues is clearly a very important part of being an effective bench scientist," Bacic continued.

In his local context of Australia, Bacic says that effective communication has been key to the ability of Australian researchers to stay competitive internationally. "We've had to engage with governments and industry to promote the importance of science and the need to invest in it. And equally we've realized that they want to see outcomes—and for them, that doesn't necessarily mean a paper in *Science* but research translated into products," he explained. "We have to think about how we can try to sell our idea to a businessman to take up the technology, or how to appeal to governments for funding, or how to include the lay community so that they can tell the government how important it is that we pursue our research. We have to try to get our message out through every possible channel, because we can no longer take for granted that everyone thinks this business of science is a noble pursuit."

Sarah Nell Davidson
snd2@cornell.edu

Membership Corner

ASPB members share a common goal of promoting the growth, development, and outreach of plant biology as a pure and applied science. This column features some of the dedicated and innovative members of ASPB who believe that membership in our Society is crucial to the future of plant biology. If you are interested in contributing to this feature, please contact ASPB Membership at info@aspb.org.

Name: Liwen Jiang
Title: Associate Professor
Place of Work or School: Department of Biology, The Chinese University of Hong Kong
Research Area: Protein targeting and organelle biogenesis
Member since: 1994

1. **Why has being a member of ASPB been important?**
   For my career development since I was a graduate student; this is also true now, being a faculty member.
2. **Was someone instrumental in getting you to join ASPB?**
   Not really. I joined ASPB when I attended my first Society meeting as a graduate student.
3. **What would you tell colleagues to encourage them to join?**
   It is important for your career development, no matter whether you are a graduate student, postdoc, or faculty in plant sciences.
4. **Have you enhanced your career using ASPB job postings or through networking at an ASPB function?**
   I think I learned about my postdoctoral position via ASPB. Attending ASPB meetings and presenting data there are important for learning and letting people know about your work.
5. **Have you had any success at finding candidates as a result of a job posting at the meeting or on our online Job Bank?**
   Not yet.
6. **Do you read print journals? If so, where do you usually read them?**
   Yes, I print selected papers in pdf format and read them mainly at home while watching TV or during travel.
7. **What do you think is the next "big thing" in plant biology?**
   Still the very basic cell biology, which is important for all the new developments in genomics, proteomics, etc.
8. **What are you reading these days?**
   Papers related to teaching and research—not much time for reading novels yet.
9. **What are your hobbies?**
   Music and sports to keep relaxed and energetic.
10. **What is your most treasured possession?**
    Good health and my family.
11. **What do you still have left to learn?**
    Pretty much everything. We face new challenges every day in classes, in the laboratory, and at home.

Letter

Scotobiology: A New Branch of Biological Science

To the Editor:

As a member of the Ecology of the Night Symposium held at Muskoka, Ontario, in 2003, I recognized that many of the scientific presentations described biological reactions and behaviors that can work properly only in darkness and are seriously affected or prevented by night-time light pollution. This research area of biological science has been called Scotobiology—The Biology of the Dark. Many important biological systems are affected by light pollution: the hunting, feeding, and breeding habits of wild animals, amphibians, and insects; the life-cycles of plants (e.g., time of flowering, onset of dormancy); the migration and flight patterns of birds; and the health of humans, whose immune systems can be disturbed by night-time light leading to increased incidence of diseases such as cancer and psychological disorders. Scotobiology, the study of the effects of night-time light pollution, is generating strong interest. A search of "scotobiology" in Google lists a number of the recent publications and discussions in this new field of biology. Scotobiology reactions are not directly related to photobiology, although some dark-requiring reactions are inhibited by specific light responses.

R.G.S. (Tony) Bidwell

ASPB Supports Existing and New Research Initiatives for Next Farm Bill

ASPB expressed support for existing and new agricultural research initiatives in comments to the Senate Committee on Agriculture, Nutrition and Forestry for the committee's March 7 hearing record. For this hearing, titled "Investing in Our Nation's Future Through Agricultural Research," the committee collected information for consideration in writing the research title of the upcoming Farm Bill. The following are some of the recommendations ASPB made in its comments:

Reauthorization of the National Research Initiative Competitive Grants Program

Reauthorization of the National Research Initiative Competitive Grants Program (NRI) within the Department of Agriculture Cooperative State Research, Education and Extension Service (CSREES) is essential to continued support for leading fundamental research in agriculture. The need for increased support of the NRI was explained by the National Research Council (NRC) in its report "National Research Initiative: A Vital Competitive Grants Program in Food, Fiber and Natural-Resources Research." The NRC found that "without a dramatically enhanced commitment to merit-based peer-reviewed food, fiber and natural resources research, the nation places itself at risk."

ASPB urges the committee to reauthorize funding authority for the NRI in the Farm Bill to enhance and build on current leading research programs.

Authorization of NIFA

ASPB supports the authorization of the National Institute of Food and Agriculture (NIFA) as proposed in S. 2782 in the 109th Congress. The NIFA legislation contains recommendations from a report of a task force appointed by the Department of Agriculture and chaired by Dr. **William Danforth**. NIFA would advance fundamental knowledge of benefit to agricultural producers and consumers.

Americans look to agricultural research to help meet a number of the nation's most fundamental needs—our food, feed, and fiber supply; huge increases in the supply of clean-burning transportation fuels; and a more sustainable environment. Research supported by USDA in past years has helped bring plant science and related sciences to a point where they can project advances that will better meet increased demands for food, fiber, fuel, and a sustainable environment. The increased commitment of support for fundamental research contained in NIFA would make possible greater advances in these areas. NIFA would bring the needed commitment of research to help address enormous demands for food, feed, fiber, and fuels produced in a sustainable manner.

Authorization of the Specialty Crop Research Initiative

The Specialty Crop Research Initiative proposed by the Department of Agriculture for inclusion in the Farm Bill would invest $1 billion over 10 years to provide science-based tools to the specialty crop industry. Specialty crops grown in the United States represent $49 billion in sales. Increasing the level of federal research support devoted to the study of specialty crops can be expected to lead to new varieties that will reduce the susceptibility of specialty crops to freezes and other severe weather conditions and enhance crop growth, development, and yield. Scientists can project advances in research that will lead to increased phytonutrient content of specialty crops, which would contribute to the improved health and nutrition of Americans. ASPB supports authorization of the Specialty Crop Research Initiative.

Reorganization Proposals

There are significant differences between managing an intramural research program and managing an extramural research program. Key to the success of CSREES and Agricultural Research Service (ARS) research programs are the knowledge, experience, and dedication of current CSREES and ARS national program leaders and of administrators of the agencies. ASPB applauds Research, Education and Economics Undersecretary **Gale Buchanan** for assuring the committee at its March 7 hearing that existing staff would continue to be needed and relied on to administer and manage the department's world-leading research programs.

Authorization of the Agricultural Bioenergy and Biobased Products Research Initiative

ASPB fully supports the USDA in proposing the Agricultural Bioenergy and Biobased Products Research Initiative to transition to home-grown and processed plant-based fuels and biobased products while reducing dependence on foreign petroleum. Increased support by the Department of Agriculture is needed for basic research related to plant growth and development and to biotic and abiotic stress tolerance. These and related areas of research are of central importance to the long-term goal of maximizing plant productivity. USDA–NRI plant research programs on gene expression and genetic diversity, environmental stress, plant biochemistry, plant growth and development, plant genomics, biobased products, and bioenergy production research and other key areas provide valuable knowledge that plant breeders and growers will need to sustain increased bioenergy crop production.

A number of specific research targets would contribute to enhanced net photosynthetic production of feedstock crops:

- Responsiveness to elevated CO_2
- Staying green (delayed senescence)
- Refined photoprotection
- Reduced photorespiratory losses
- Improved water use efficiency
- Photosynthetic electron transfer

continued on page 19

ASPB Member Steve Long Consults with President Bush on Biofuels Research

ASPB member **Steve Long,** Robert Emerson Professor, University of Illinois, Urbana–Champaign, and other researchers and transportation experts met with **President George Bush** on February 23 to discuss promising alternatives to oil found in biofuels. Steve said that President Bush expressed the view that the more diverse the sources of liquid fuels, the less dependent the United States will be on foreign oil. Steve and the others fully agreed with President Bush on this view.

Steve commented to President Bush on the importance of fundamental plant science research in photosynthesis and in metabolic pathway engineering to improve the amount and quality of feedstock that can be generated in a sustainable manner. President Bush has launched a research initiative within the Department of Energy Office of Science that would fund three new bioenergy research centers conducting plant and microbial research related to producing cellulosic ethanol. Cellulose is the most abundant biological material on earth. President Bush noted that the recent DOE research initiatives were just the start of the support that would be given to achieving a major reduction in the use of gasoline and other foreign oil products. The Departments of Energy and Agriculture are jointly funding a research program on plant feedstock genomics and are planning further research initiatives in bioenergy and bioproducts research.

In his State of the Union address in 2006, President Bush introduced to millions of listeners exciting plant reasearch opportunities related to biofuels. He said, "We'll also fund additional research in cutting-edge methods of producing ethanol, not just from corn, but from wood chips and stalks, or switchgrass. Our goal is to make this new kind of ethanol practical and competitive within six years. Breakthroughs on this and other new technologies will help us reach another great goal: to replace more than 75 percent of our oil imports from the Middle East by 2025. By applying the talent and technology of America, this country can dramatically improve our environment, move beyond a petroleum-based economy, and make our dependence on Middle Eastern oil a thing of the past."

Reports and studies by the Departments of Energy and Agriculture support President Bush's projection of reduced dependence on foreign oil through research. Members of the science community have joined in projecting large increases in the use of cellulosic ethanol, biodiesel, and other biofuels through research. For more information on opportunities in biomass production for use as biofuels, see the April 2005 Department of Energy and USDA report titled *Biomass as Feedstock for a Bioenergy and Bioproducts Industry: The Technical Feasibility of a Billion-Ton Annual Supply* at http://feedstockreview.ornl.gov/pdf/billion_ton_vision.pdf.

Steve Long consults with President Bush in the Oval Office on opportunities in plant research that will lead to vast increases in biofuels production. President Bush, with bipartisan support in Congress, is launching a comprehensive and well-designed biofuels research initiative fully supported by ASPB. White House photo by Eric Draper.

President George W. Bush walks Steve Long (holding notebook), Department of Energy Secretary Sam Bodman (to Steve's left), and other transportation fuel experts and researchers back to the Oval Office after a demonstration of alternative fuel automobiles on the South Lawn of the White House February 23, 2007. "It's going to require continued federal research dollars, and I call upon the Congress to fully fund my request for alternative sources of energy," said President Bush. White House photo by Eric Draper.

ASPB Member Arntzen Presents PCAST Energy Report to President Bush

ASPB member **Charles Arntzen** and his colleagues on the President's Council of Advisers on Science and Technology (PCAST) have prepared for **President George W. Bush** the report *The Energy Imperative: Technology and the Role of Emerging Companies.*

Charlie was part of a six-member delegation from PCAST that met with President Bush, **Vice President Dick Cheney,** and Secretary of Energy **Sam Bodman** and others in the Oval Office December 1 to present a briefing on the report. Charlie, whose presentation to President Bush was on biofuels, had worked earlier with ASPB and its members in collecting information for consideration in preparing the report.

In the report, PCAST recommended an increase in federal support for science and technology research and development. PCAST noted that many of the advanced energy technologies the report described had originated, at least in part, from federally funded research. PCAST recommended fully funding President Bush's American Competitiveness Initiative and Advanced Energy Initiative (AEI). PCAST also urged inclusion of USDA in an expanded AEI.

The report also included the following overarching recommendations:

- Promote the Energy Policy Act of 2005 incentives.
- Support state energy initiatives.
- Position the federal government as an early adopter of new technology.

The report is available at http://www.ostp.gov/PCAST/PCAST-EnergyImperative_FINAL.pdf.

Charles Arntzen and fellow PCAST members presented a PCAST energy report to President Bush in the Oval Office. From left to right: White House Office of Science and Technology Policy Director John Marburger, ASPB and PCAST member Charles Arntzen, PCAST member Mary Anne Fox, President George Bush, PCAST member Steven Papermaster, PCAST member Martin Jischke, and PCAST Co-Chair Floyd Kvamme. White House photo by Eric Draper.

The Arabidopsis Book

The American Society of Plant Biologists has published *The Arabidopsis Book (TAB)* as a free online compendium since 2002.

Founding editors Chris Somerville and Elliot Meyerowitz, and former editors Jeff Dangl and Mark Stitt, have brought over 50 chapters online, all available free of charge on the Internet. In 2006, *TAB* received 100,000 full-text downloads.

The editors and ASPB are pleased to announce that *TAB* now has a new editorial board to guide its ongoing expansion:

Caren Chang, University of Maryland
Ian Graham, University of York
Rob Last, Michigan State University
Ottoline Leyser, University of York
Rob McClung, Dartmouth College
Cynthia Weinig, University of Minnesota

The new board will be overseeing all new content development as well as updates to existing chapters to keep *TAB* the most comprehensive and current work on Arabidopsis.

ASPB is providing funds for the production of *TAB* as a public service. All chapters are hosted in partnership with BioOne (www.bioone.org) in HTML and PDF formats.

Committee on Public Affairs Meets with Congressional Offices, Agency Officials

Committee on Public Affairs members met with their congressional offices and National Science Foundation (NSF) officials on March 13 concerning research programs supporting plant research. The congressional and agency visits followed a day-long business meeting March 12, in which the committee considered a number of federal policy issues and initiatives affecting plant science.

Committee on Public Affairs member Rob Last of Michigan State University visits with U.S. Senator Debbie Stabenow (D-MI).

Chairman **Gary Stacey,** University of Missouri; **Roger Innes,** Indiana University; **Steve Howell,** Iowa State University; **Rob Last,** Michigan State University; **Martha Hawes,** University of Arizona; and student representative **Jeff Gordon,** Cornell University, took part in the visits and business meeting.

The committee expressed support for existing and newly proposed research programs supporting plant research. Newly proposed research programs supported by the committee include the National Institute of Food and Agriculture Act of 2007 (Senate Bill 971), sponsored by Senator **Kit Bond** (R-MO); the USDA-proposed Agricultural Bioenergy and Biobased Products Research Initiative, providing $500 million over 10 years; the USDA-proposed Specialty Crop Research Initiative of $1 billion over 10 years; the Plant Science Cyberinfrastructure Collaborative of $5 million in the NSF fiscal year 2008 budget request and of up to $50 million over five years; and $75 million for three Department of Energy bioenergy research centers studying plants and microbes for cost-effective production of cellulosic ethanol for fiscal year 2008, expected to reach a cumulative total of $375 million over five years.

The committee discussed ways to further support these and existing leading research programs sponsoring basic plant research and conveyed their message to congressional offices. The committee also addressed ways to aid grower group support efforts for leading plant research programs.

Committee members discussed plans for ASPB coordination with the Department of Agriculture Cooperative Research, Education and Extension Service of a Plant and Pest Biology Stakeholders workshop this fall. This would be the third Plant and Pest Biology Stakeholders workshop coordinated by ASPB; the first two were held in 2002 and 2005.

Machi Dilworth, division director of the NSF Division of Biological Infrastructure, met with Committee on Public Affairs members and explained aspects of leading research programs within her division. The division builds and develops innovative scientific infrastructure that empowers the biological research community to advance all fields of biology under the purview of the Directorate for Biological Sciences. The division is organized into two clusters: research resources and human resources. An increase of 11.9% to $96.1 million is in the fiscal year 2008 budget request for the division.

Judy Verbeke, NSF Directorate for Biological Sciences (BIO) senior adviser, discussed major components of the Emerging Frontiers programs, including support for the important new Plant Science Cyberinfrastructure Collaborative. The fiscal year 2008 budget request for Emerging Frontiers is $99.16 million, the same as in fiscal year 2007.

Maryanna Henkart, director of the division of Molecular and Cellular Biosciences (MCB), reviewed aspects of the programs her division supports. Priorities for MCB are in plant biology; microbial biology, living networks, and complex processes; integration of education and broadening of participation in all aspects of molecular and cellular research; and fundamental research and education at the interface of biology and the physical sciences. The fiscal year 2008 budget request for MCB is $116.37 million, an increase of 4.6% over the current fiscal year.

Tom Brady, director of the division of Integrative Organismal Systems (IOS), discussed changes in the division formerly known as Integrative Organismal Biology. Brady said that the change in name reflects an enhanced focus on understanding emergent properties of living systems. For 2008, IOS will place highest priority on highly creative, integrative, and transformative studies that lead to a deeper understanding of the emergent properties of organisms. The fiscal year 2008 budget request for IOS is $105.49 million, an increase of 4.7% over the current year.

DOE Energy Biosciences Seeks $38 Million in Fiscal Year 2008

Vanderhoef Urged Support for Leading Basic Research

The fiscal year 2008 budget request for the Department of Energy's Office of Science, Office of Basic Energy Sciences, Energy Biosciences program is $38 million, an increase of more than 6%.

Larry Vanderhoef, chancellor of the University of California, Davis, cited the importance of leading fundamental research supported by the Energy Biosciences program as Office of Science officials developed the fiscal year 2008 budget. Vanderhoef continues to be a key leading supporter of the Energy Biosciences program and the Office of Science, as he has been for a number of years.

The Energy Biosciences program supports research on molecular mechanisms of natural solar energy conversion (photosynthesis) and metabolic regulation of energy production. The section on molecular mechanisms of natural solar energy conversion supports fundamental research to characterize the molecular and chemical mechanisms involved in the conversion of solar energy to chemical energy. Research supported includes the characterization of the chemical processes occurring during photosynthesis, natural catalytic mechanisms involved in the synthesis of chemical fuels, and the chemistry of carbon dioxide fixation. The metabolic regulation section supports fundamental research in the molecular processes that regulate chemical reactions important to energy conversion within cells.

Richard Greene, program manager for the Energy Biosciences Program, said that the program will be seeking a program officer detailed to the program beginning at the end of this summer. Those interested in this one-year position should contact Greene at Richard.Greene@science.doe.gov.

Research on Prairie Grass Contributes to Sustainable Energy Production

In a 10-year experiment reported in *Science* in December 2006, ecologist **David Tilman** of the University of Minnesota and **Jason Hill** of the Department of Applied Economics at the University of Minnesota and their colleagues explored how much bioenergy could be produced by 18 different native prairie plant species grown on highly degraded and infertile soil.

Tilman and Hill reported on their findings again in an article published Sunday, March 25, in the *Washington Post,* available at http://www.washingtonpost.com/wp-dyn/content/article/2007/03/23/AR2007032301625.html.

The scientists planted 172 plots in central Minnesota with various combinations of the 18 species, randomly chosen. They reported that on highly degraded land, the plots planted with mixtures of many native prairie perennial species yielded 238% more bioenergy than those planted with just a single species. They said that high plant diversity led to high productivity, and little fertilizer or chemical weed or pest killer was required.

According to Tilman and Hill, mixed prairie grass can serve as biofuel crops that can be grown with much less energy and chemicals than the food crops currently used for biofuels. Prairie grass biofuel crops can be grown on less fertile land, including land that has been degraded by farming, which would decrease competition between food and biofuels, they noted. The United States has about 60 million acres of such land in the Conservation Reserve Program, road edge rights-of-way, and abandoned farmlands.

The study also found significant greenhouse gas benefits. When high-diversity mixtures of native plants are grown on degraded soils, they remove carbon dioxide from the air, Tilman and Hill found. They commented that much of this carbon ends up stored in the soil. "In essence, mixtures of native plants gradually restore the carbon levels that degraded soils had before being cleared and farmed. This benefit lasts for about a century," Tilman and Hill said.

Increased basic and applied research on prairie grass and related species could contribute to cost-competitive and sustainable production of cellulosic ethanol.

NABC Sees Biofuel Power Emerging in "The Road Forward"


Ralph Hardy

The National Agricultural Biotechnology Council (NABC), a consortium of 34 research and educational institutions in the United States and Canada, has developed the report *Agriculture and Forestry for Energy, Chemicals and Materials: The Road Forward.* Free access to the report is available at http://nabc.cals. cornell. edu/pubs/The_ Road_ Forward.pdf. **Ralph Hardy** made significant contributions to writing the report. Hardy, who was treasurer of ASPB from 1973 to 1976, is president of NABC.

This document identifies new value-added markets for agriculture and forestry, with projected benefits, targets, and structure. The following is the summary from the report:

> The NABC Road Forward calls for a national mobilization—by academe, government and industry—to expeditiously move the United States economy from mainly petroleum-based to more sustainable biologically and petroleum-based, with 100+ billion gallons annually of transportation fuel and value-added chemicals and materials produced from biomass. The plant-based agricultural and forestry traditional commodity and new value-added markets can be simultaneously served without any long-term negative impacts of one on the other, provided there is major biosource and bioprocess innovation for biobased industrial products. The benefits will be far-reaching, from self-sufficiency in transportation fuel with improved homeland security, more sustainable industries, revitalization of rural economies and improved balance of payments, to mitigation of environmental problems. Targets for biosources, processes and costs are proposed as well as an integrated structure for success by 2025.

The report cited benefits of plant and related research that will lead to cost-competitive, vastly increased production of biofuels and other biobased products. The authors called for a transition from the inherently unsustainable dominant use of petroleum to a more sustainable use of agricultural and forestry sources in combination with efficient use of declining petroleum reserves. Improved sustainability, they noted, is a built-in benefit of biobased products.

Biobased energy sources will contribute to homeland and economic security in at least two ways. They will substantially decrease or, in time, even eliminate the need for up to 60% of petroleum currently imported, much from politically unstable regions. In addition, energy self-sufficiency would increase the reliability of inputs for manufacturing, transportation, electricity, and heating.

The report cites biobased energy sources' potential contributions to the country's economic strength:

- Additional annual gross farm-gate revenue could reach over $40 billion.
- Rural communities would benefit from economic development and job creation.
- New rural investment would amount to a minimum of $200 billion for biofuel production plants, and additional investment would be made available for chemical and material manufacturing.
- Annual capital exports would be reduced by savings in the cost of petroleum imports, which were about $250 billion to $300 billion in 2006.
- New value-added chemicals and materials would be developed for domestic and export sales.
- The United States could secure world leadership in agriculture, forestry, and industrial biotechnology.
- Finally, the environment and human health would benefit as well. Biobased fuels would substantially reduce future increases in net greenhouse gas emissions; mitigate global climate change; and reduce pollution of air, water, and soil and the impact on human health from petroleum-combustion by-products.

Future ASPB Meetings

Plant Biology 2008
Mérida, Mexico
June 27–July 2
Joint Annual Meeting of the American Society of Plant Biologists and the Sociedad Mexicana De Bioquímica
Rama: Bioquímica y Biología Molecular de Plantas

Plant Biology 2009
Honolulu, Hawaii
July 18–22

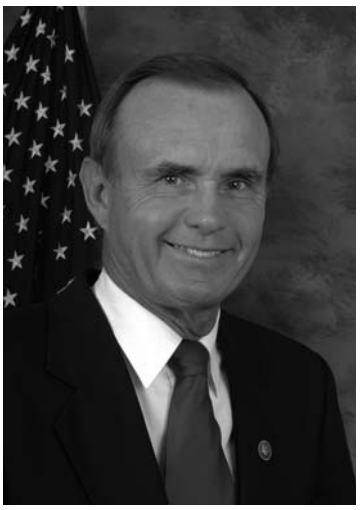
Plant Biology 2010
Montreal, Canada
July 30–August 5
Joint Annual Meeting of the American Society of Plant Biologists and the Canadian Society of Plant Physiologists—*Société Canadienne de Physiologie Végétale*

For more information go to www.aspb.org/meetings/

Public Affairs

Congressman Brian Bilbray Calls for Support for Biological Sciences

Congressman **Brian Bilbray** (R-CA) has led a successful effort supporting inclusion of biological sciences, social sciences, and interdisciplinary research in federal research funding authorization. He received support in this effort from Committee on Science and Technology Chairman **Bart Gordon** (D-TN), committee ranking member **Ralph Hall** (R-TX), and other members of the committee.


Congressman Brian Bilbray

Bilbray expressed concern over House legislation (H.R. 363) that was scheduled to come before the committee on February 28 that would have authorized funding, including a 10% increase for the physical sciences, mathematics, and computer science and engineering for the National Science Foundation, Department of Energy, National Aeronautics and Space Administration, National Institute of Standards and Technology, and without limitation of science discipline for the Department of Defense.

This multiagency authorization bill contained no funds for the biological or social sciences. Hill staff said that biological and social sciences would be included in future authorization bills to be drafted and considered for authorizations for each agency. Biological and social science societies remained concerned about H.R. 363's exclusion of support for biology and the social sciences.

Congressman Bilbray received support February 27 from ASPB and other biological and social science societies in proposing report language to accompany H.R. 363 that would recognize support for all science disciplines, including biological, social, and behavioral sciences, and cite the need for interdisciplinary research. The following is Congressman Bilbray's proposed report language:

> The Committee appreciates the increasingly interdisciplinary nature of science research, which is occurring more often at the boundaries of the physical sciences, life sciences and social and behavioral sciences. If we are to retain our scientific advantage in the world, we will need to rely inclusively on all basic sciences and technologies. To begin to prioritize one field of research over another will not only fracture the interdisciplinary nature of the current research structure, but will also set us back in our quest to solve many of our most puzzling scientific mysteries. Therefore, the Committee calls for investment to improve the nation's research and training capabilities in and across all fields of science, engineering and mathematics.

Committee staff studying Congressman Bilbray's proposed report language responded that the authorization section that had excluded biology and the social sciences would be deleted with a chairman's amendment, which was indeed drafted and passed the next day, February 28, in the committee's markup of H.R. 363. This action negated the need for inclusion of the report language.

Committee staff said upcoming authorizations bills to be offered in the committee for each research agency will include all science disciplines.

Meyerowitz's NSF-Supported Outreach Helps Ground Students in Plant Biology

How do you get today's students excited about plant biology? That was the question that inspired the creation of the "Grounding in Botany" course at the Huntington Botanical Center in southern California. Each year, Professor **Elliot Meyerowitz,** California Institute of Technology, along with others in the plant biology field, presents a four-week professional development course for high school science teachers. Course participants discuss and demonstrate different ways of getting students interested in plant biology. Following completion of the course, participants are invited back for five follow-up workshops.

On February 7, 2007, the Huntington Botanical Center held an exhibit at the National Science Foundation's open house in the Arlington, Virginia, headquarters as the fiscal year 2008 budget request was released. At the open house, ASPB member Meyerowitz and representatives from the center provided information on the program, along with hands-on demonstrations to interest children.

This year, the Grounding in Botany course will be held July 10–August 3, Tuesdays through Fridays, at the Huntington

Elliot Meyerowitz

Mike Kerkman, an educator at the Huntington Botanical Center in San Marino, Calif., encourages two "future scientists" to examine parts of a flower under a microscope. Photo by Curt Suplee, National Science Foundation.

continued from page 12

- Characterization of carbon-partitioning mechanisms in plants.

Metabolic Engineering

To transition to a plant-based energy economy, more investment is needed in plant research on metabolic engineering. To modify existing crop plants (or other plants that would then serve as new energy crops) in a way that will enhance their properties for use as either fuels or as specialty chemical feedstocks, researchers must understand the metabolism of those plants, and they must be able to predictably and accurately modify the metabolism in those plants. There is a rapidly growing and significant body of literature that demonstrates that production of specific individual compounds in plants is not predictable with current knowledge. Further knowledge will be needed in metabolic engineering to change large subsets of metabolism as may be required for alterations in biomass production.

Competing with All Imported Petroleum Market Sectors

ASPB recommends collaborations between the Departments of Agriculture and Energy in identifying ways to derive energy from a broad variety of plants for ethanol, cellulosic ethanol, and biodiesel. Both departments have relationships with plant scientists who could share their knowledge of ways to exploit energy sources in plant cellulose in switchgrass, miscanthus, trees, wood chips, crop residues, and other sources of biomass.

Along with corn and sorghum, research could offer future ethanol production opportunities with sweet potato, sugarcane, and other crops. For sugarcane, research is needed to increase drought and cold stress tolerance. Gains in production in biodiesel from soybean and other regionally grown oilseed crops could result from accelerated bioenergy research. In addition to production of biofuels, increased support for plant bioenergy research could lead to advances in production of high-value biochemical products, such as superior quality nylon and polyurethane, that have historically been derived from petroleum.

Interactive Plant Research Experiences Offered Through ASPB Booth at NSTA Convention

The 2007 meeting of the National Science Teachers Association, held in St. Louis March 29–April 1, was a great success for ASPB in creating enthusiasm and ideas among science teachers. University of Wisconsin–Madison's Fast Plants Program partnered with ASPB at the exhibit booth, featuring K–12 classroom instructional materials for studying plants.

According to Dan Lauffer, outreach program manager for the Center for Education Research at the University of Wisconsin–Madison, the overall "number of teachers visiting the exhibition hall this year was lower than prior years. On an average year, we generally hand out nearly 1,200 copies of handouts and hands-on materials. This year, the number of visitors to our booth was around 800. However, the materials and ideas for the classroom were well received, and teachers regularly noted the need for plants in their classrooms to teach the standards students need to know at each grade level."

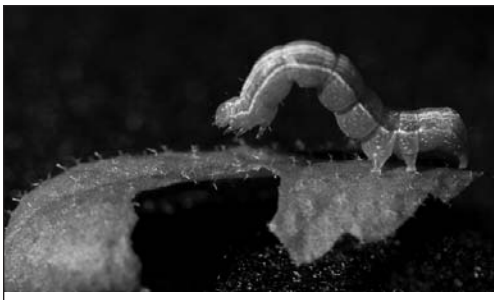
The enthusiasm of the teachers who visited the booth can be attributed to the interactive exhibits. According to the Fast Plants Program report, the exhibit asked teachers to design "an experiment with two different size seeds of the same species," an exercise "designed to engage the teachers as scientist by having them ask two questions about germinations and growth and make predictions prior to setting up the experiment, which they wore around their necks in microcentrifuge tubes." The teachers were asked to return the next day to share the results, and 30% of the participants did, a much higher proportion than expected.

Suzanne Cunningham, research crop physiologist for Purdue University, provided the ASPB booth with experiments from the university's Agronomy K–12 Outreach Program. The purpose of the outreach program is to "highlight inexpensive, interactive experiments in plant and environmental science for elementary, middle, and high school students," and Cunningham showcased these experiments at the convention. The exhibits consisted of "lights and plants from Wisconsin Fast Plants, clays, [and] small-bottle demos highlighting charge, water-binding capacity, and erosion experiments. . . . The little starch–agar gels and assorted seeds growing at my table kept people stopping by and asking questions. What really helped was the fact that all of us could gear whatever we were showcasing to elementary, middle, or high school learning objectives."

Support for the booth, proposed by the ASPB Education Committee, was provided by the ASPB Executive Committee, which awarded Good Works funds for this successful education outreach effort.

Right: Suzanne Cunningham answers questions from teachers on the starch–agar gels at the ASPB booth.

Below: Suzanne Cunningham (left) shows teachers experiments from the Agronomy K–12 Outreach Program.



CALL FOR PAPERS

Plant Physiology Focus Issue on Plant Interactions with Arthropod Herbivores

Plant Physiology is pleased to announce a Focus Issue on Plant Interactions with Arthropod Herbivores to be published in March 2008. The issue will be edited by Georg Jander and Gregg Howe. Submissions describing novel aspects of any interaction between plants and arthropod herbivores are welcome. Emphasis should be on molecular and biochemical aspects of the interaction, including recognition of herbivory, signaling pathways that regulate host plant defense, volatile signals, tritrophic interactions, plant defense chemistry, manipulation of plant defenses by herbivores, and natural variation in plant resistance to herbivores.

Authors interested in contributing should indicate this in the cover letter when submitting papers online at http://submit.plantphysiol.org/. Please select "Plant-Herbivore Interactions, March 2008" from the Focus Issue list in the online submission system. Articles published within 2 years before and after the Focus Issue will be considered for inclusion in an online Focus Collection of articles relevant to the focus topic.

Please contact Georg Jander (gj32@cornell.edu) or Gregg Howe (howeg@msu.edu) for additional information.

Deadline for Submissions: November 1, 2007.
To submit an article, please go to http://submit.plantphysiol.org.

Obituaries

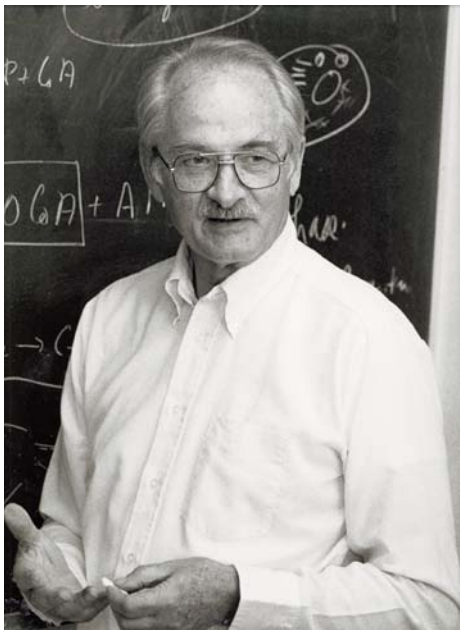
The ASPB News *has assembled links to all obituaries published in the newsletter since January 2003 at http://www.aspb.org/newsletter/obituaries.cfm. Please contact the editor at nancyw@aspb.org with questions or suggestions.*

Paul Karl Stumpf

Former ASPP President Paul Karl Stumpf died February 10, 2007, of inoperable prostate cancer at his home, just 13 days before his 88th birthday. He had known of his illness for several years but suffered little pain. His last few days were spent sleeping, and his passing was peaceful, with his wife Ruth and one of his daughters nearby.

Paul was born in New York City on February 23, 1919, but never knew his father, Karl Stumpf, a bass clarinetist with the Boston Symphony, who had died 2 months earlier. In 1920, his mother, Annette Stumpf, took Paul and his older brother Felix back to Blankenberg, Germany, to raise them near his father's family and escape the anti-German feelings still existing in the United States after World War I. However, in 1923 she became discouraged with conditions in Germany and returned to New York, where her sons started school. In 1930, she used an inheritance to purchase a small seaside resort hotel near Bridgeton, Maine, where her sons attended the local high school with a total enrollment of 126 students. Paul achieved high grades and in 1932 read Paul de Kruif's *Microbe Hunters.* This small book had a great influence on him; he later attributed to it his decision to become a research scientist in the biological sciences.

When Paul's brother was accepted to Harvard College for the fall of 1934, his mother, determined to provide her sons with an excellent education, moved her family to Cambridge and established a boarding house. Paul was enrolled in the Cambridge High and Latin School, together with 4,000 other students. He survived his first year, won a competitive science prize and medal in his second, spent another year at the school, and then entered Harvard College in 1937 on a full fellowship. As an honors student, Paul was required to do a research project and decided to work with enzymes. The chair of biochemistry at Harvard Medical School introduced him to a new arrival from England, David E. Green, who assigned Paul to purify a new enzyme, potato starch phosphorylase. His first paper in the *Journal of Biological Chemistry,* coauthored with Green, appeared in April 1941 just before Paul received his AB cum laude in June. When Green moved to Columbia University that fall, Paul followed to pursue his PhD under Green. His thesis, "The Pyruvic Dehydrogenase of *Proteus Vulgaris,*" was completed in 1945 and published in the *Journal of Biological Chemistry* with Paul as sole author.



Eager to establish his own career, Paul initially hoped to study enzymes involved in virus growth and reproduction at the School of Public Health, University of Michigan. He soon decided that such work would be difficult because of the limited knowledge of viral biochemistry. Paul met and married Ruth Rodenbeck in Ann Arbor during the 18 months he was at the University of Michigan. In the fall of 1947, he accepted an appointment at the University of California at Berkeley, as an assistant professor of plant nutrition, and his initial studies were on glycolytic enzymes in plants. However, his reading of James Bonner's first edition of *Plant Biochemistry* indicated that little was known about ß-oxidation of fatty acids in plants, encouraging Paul to initiate research on lipid metabolism in plants. After 10 years on the Berkeley campus, where he attained the rank of professor in the Department of Agricultural Biochemistry, he transferred to the Davis campus to establish a new Department of Biochemistry and Biophysics. The department was warmly received, and Paul began an active teaching and research program in 1959. He served on four occasions as chair of that department.

Paul justifiably deserves to be called the father of modern plant lipid biochemistry. In more than 250 publications, he and his coworkers discussed diverse topics ranging from the initial steps in fatty acid biosynthesis to the assembly of membrane and storage lipids to the degradation of lipids. His work has received more than 7,500 citations and, 20 years after his retirement, is still frequently cited. He is perhaps best known for his extensive characterization of the systems for fatty acid biosynthesis in plants. These studies included the identification of the many component enzymes, their subcellular localization, and the discovery of the prokaryotic nature of enzymes of fatty acid synthesis and of the chloroplast acetyl-CoA carboxylase. The discovery of acyl-ACP thioesterases led to a description of CoA track versus ACP track reactions that was a conceptual precursor to the prokaryotic and eukaryotic two-pathway hypothesis that has underpinned much of modern plant lipid research. A major early discovery was the pathway of alpha oxidation, described initially in 1956 and in more detail in 1974. The system is now known to be involved in plant pathogen responses, and the enzymes responsible have recently been cloned. Paul's discoveries in plants preceded the identification of the pathway in animals and the later connection of adult Refsum's disease to the inability of humans to metabolize phytanic acid by alpha oxidation.

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Paul trained more than 60 students, postdocs, and visiting scientists, many of whom went on to become leaders in plant biochemistry research. Throughout his career, he maintained a close connection with bench work. He trained every new arrival in the lab on the use of the gas chromatographs and their radioisotope detectors, and when an instrument needed maintenance, Paul provided hands-on repairs. He was also creatively engaged in each research project, making many suggestions for experiments while allowing students and postdocs the freedom to follow their own intuition. Many of those who trained with Paul have fond memories of the atmosphere in the Stumpf lab as an excellent place to do science and of the relaxed social interactions that included trips to the Stumpf cabin near Lake Tahoe.

In addition to his fundamental research contributions, results from the Stumpf lab laid the foundation for the genetic modification of oilseeds to improve their fatty acid composition. Paul was a key early adviser and consultant for Calgene, the successful biotech company founded in Davis. Much of the early success of Calgene in transgenic modification of the fatty acid composition of canola rested on the groundbreaking characterization and purification of acyl-ACP desaturases and thioesterases that were carried out in Paul's lab.

Paul made full use of the sabbatical leave policy of the University of California. His first leave was spent with Bernard Horecker's group at the National Institutes of Health (NIH), where he used fluorescence to identify a long-chain aldehyde as a product of alpha oxidation of long-chain fatty acids. Later sabbaticals were in London, with A. T. James; in Copenhagen, with D. von Wettstein; in Cologne, with W. Stoffel; and in Canberra, with K. Boardman, and these leaves were similarly productive. He appreciated that such leaves gave him a break in his teaching and administrative duties at Davis and opportunities to renew his research skills. His family always accompanied him because he felt it was good for his children to experience new environments and learn to adapt to new friends and schools.

During his career, Paul coauthored, with John B. Neilands, two editions of *Outlines of Enzyme Chemistry* and, with Eric Conn, five editions of the popular *Outlines of Biochemistry.* He also was coeditor-in-chief with Conn of the 16-volume treatise *Biochemistry of Plants.* He authored numerous chapters in symposia volumes and served in an editorial capacity on several scientific journals. He served on the program advisory committee of the Palm Oil Research Institute of Malaysia from 1982 to 1991, as well as on the scientific advisory boards of Calgene and the University of Maryland Biotechnology Center. He also served on numerous review and advisory panels for NIH, the National Science Foundation, and USDA.

Paul was elected a member of the National Academy of Sciences in 1978 and the Royal Danish Academy of Sciences in 1975. He received the Stephen Hales Prize from the American Society of Plant Physiologists in 1974, served as its president in 1980, and chaired its Board of Trustees from 1986 to 1990. In 1992 he was awarded the Charles Reid Barnes Life Membership by the society. Other awards were the Lipid Chemistry Prize from the American Oil Chemists Society, a Senior Scientist Award from the Alexander von Humboldt Foundation of Germany, and two Guggenheim Foundation Fellowships (1962 and 1969). In 1994 Paul was elected a fellow of the American Association for the Advancement of Science.

After Paul became professor emeritus at the University of California, Davis, he took the helm of the Competitive Grant Program at USDA–CSREES from 1988 to 1991 and helped develop it into the National Research Initiative. In 1999, to support education and research in the department he had founded, he and his wife Ruth endowed the Paul K. and Ruth R. Stumpf Professorship in Plant Biochemistry in the Section of Molecular and Cellular Biology at the University of California, Davis.

Twenty-two years of retirement permitted the Stumpfs to enjoy numerous trips around the world. They loved to travel and participated in about 50 Elderhostel programs, including one to Antarctica. Golf bags were frequently packed on these trips, because Paul had what one daughter described as a "hate–love" relationship with that sport.

Paul Stumpf is survived by his wife Ruth and five children and their spouses—Ann Shaw (Michael), Kathryn Fruh (Bill), Margaret Noonan (Mark), David Stumpf (Susan), and Richard Stumpf (Patrice)—as well as 11 grandchildren and one great grandson.

Eric Conn
Professor Emeritus
University of California, Davis

John Ohlrogge
Michigan State University

Shang Fa Yang

Shang Fa Yang, emeritus professor at the University of California, Davis, passed away from complications of pneumonia on February 12, 2007, at the age of 74. His death was sudden and unexpected, leaving his friends and colleagues mourning the loss of an outstanding scientist and mentor. As the discoverer of the pathway for the biosynthesis of ethylene and the namesake of the Yang Cycle for the regeneration of methionine, which initiates this pathway, he leaves a legacy of notable contributions to plant biology.

Shang Fa Yang was born in 1932 in Taiwan, where he received his BS and MS degrees in agricultural chemistry from the National University in the late 1950s. He received a scholarship to do graduate work at Utah State University and received his PhD in plant biochemistry there in 1962. He then went to the University of California, Davis, where he did postdoctoral work with Dr. Paul K. Stumpf on lipid metabolism in higher plants. (In an unfortunate coincidence, Professor Stumpf passed away two days before Shang Fa died.) Shang Fa was eager to see the East Coast and obtained a fellowship to the New York University (NYU) Medical School, where he worked with Professor B. N. LaDu. He returned to California and to plant biochemistry the next year as a postdoctoral scientist with Andrew A. Benson at Scripps Institute of Oceanography in La Jolla, Calif. His stay on the East Coast was rewarding personally, because that is where he met his wife, Eleanor, who was studying accounting at NYU.

In 1966, Shang Fa was hired as an assistant biochemist in the Department of Vegetable Crops at the University of California, Davis. A strong advocate for his hiring was Harlan K. Pratt, a pioneering researcher in ethylene physiology with whom he initially shared a lab in the newly constructed Mann Laboratory. Shang Fa's early studies on ethylene were assisted by the homemade gas chromatograph that Pratt had cobbled together. Although large and cumbersome, that instrument could measure the parts-per-million concentrations of ethylene produced by plants and remained in use for over 35 years. Armed with this tool and his broad knowledge of chemistry and biochemistry, Shang Fa set out to explore plant ethylene biology.

Since 1934, when ethylene was conclusively shown to be produced by ripening fruit, considerable effort had been expended to discover its biosynthetic pathway in plants. The modern search for the metabolic pathway began in 1965, when Lieberman and Mapson observed that methionine was converted to ethylene in an in vitro model system. Within a year, the same research group confirmed the biological production of ethylene from methionine. This discovery led many scientists around the world on a quest to identify the subsequent steps in the pathway. Shang Fa's first paper on ethylene in 1966 (one of more than 200 publications in his career) explored the intricacies of the in vitro model system for the generation of ethylene from methionine, and his group made many important contributions during this period.

In 1977, Shang Fa and his PhD student Douglas Adams showed that methionine was converted to S-adenosylmethionine (SAM) and that SAM was a precursor of ethylene. Doug Adams also discovered that when tissues were kept under low oxygen conditions, a treatment known to suppress ethylene biosynthesis and thereby promote postharvest storage of fruits and vegetables, a metabolic intermediate accumulated. The pace quickened, and a real race ensued among various labs, particularly that of Hans Kende at Michigan State University, to identify the intermediate between SAM and ethylene. This intensive effort culminated in 1979 when Adams and Yang identified 1-aminocyclopropane-1-carboxylic acid (ACC) as the final precursor of ethylene. Surprisingly, ACC had been known for a number of years as a nonprotein amino acid of unknown function and was available in crystalline form from a number of chemical supply houses. Following Adams and Yang's identification of ACC as the ethylene precursor, interest in the compound reached such an intensity that Sigma Chemical had to ration it for a time.

Both the Yang and Kende laboratories quickly developed assays for ACC by chemically converting it to ethylene, and physiological studies into the regulation of ethylene biosynthesis accelerated. Shang Fa's group demonstrated that under low oxygen conditions, such as root flooding, ACC could accumulate and be transported in the xylem to the shoot and subsequently converted to ethylene, inducing the leaf epinasty characteristic of waterlogged plants. His group discovered that ACC could be conjugated to malonate, resulting in an alternative pool of ACC in plant tissues. He also explored the use of various inhibitors, such as aminoethoxyvinylglycine and cobalt ion, to block the ethylene synthesis pathway at specific steps. It had been noted that methionine pools are too low in plant tissue to sustain the observed rates of ethylene synthesis. Shang Fa and his students demonstrated that the methylthio group released from SAM during the synthesis of ACC is recycled to replenish methionine levels. The reactions of this recycling pathway were subsequently christened the Yang Cycle in plant biochemistry texts.

Another contribution of his group was to demonstrate that plant tissues preferentially converted one of four ethyl-substituted isomers of ACC to butene. As plant extracts contained biologically irrelevant enzyme systems that could generate ethylene from ACC, this observation provided an important criterion that was used in the isolation of the biologically relevant enzyme. As the tools

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became available to clone and characterize the genes responsible for the steps in ethylene biosynthesis, Shang Fa contributed to many studies of the regulation of those genes in fruit ripening, plant growth, and wounding and stress responses. He wrote numerous reviews and book chapters on ethylene biosynthesis and its role in plant biology that defined this topic for a generation of plant biology students and researchers.

In parallel with these fundamental discoveries related to ethylene, Shang Fa also maintained ongoing and active research programs on auxin metabolism and action, on the biological effects of sulfite and sulfur dioxide, and on cyanide generation and metabolism in plants. In all his work, Shang Fa continually linked his discoveries to practical applications in postharvest biology and plant growth regulation. He used what he knew about physiology to learn more about ethylene biosynthesis, and he applied what he learned about ethylene biosynthesis to contribute to improvements in postharvest storage conditions. He was known for the clarity of his thought and his ability to identify and design critical experimental tests of hypotheses. Shang Fa always maintained an open mind and was willing to challenge accepted ideas, even his own, when they proved untenable in the face of experimental data.

Shang Fa had an uncommon faith in humanity and urged his students to always expect the best of people. The coupling of an affable nature and a genuine concern for his students and colleagues enabled Shang Fa to assemble a powerful and effective research group that shared his vision and strove to match his intensity. He also developed an extensive and international network of friends and colleagues. Despite his many honors, he remained humble and was always willing to share credit for the many discoveries coming out of his lab or to acknowledge the priority of other groups.

Shang Fa figured prominently at many national and international research conferences over the years and served on the editorial boards of leading journals and as a member of several learned societies. He won many awards and honors, including the Campbell Award of the American Institute of Biological Sciences in 1969, a Guggenheim Fellowship in 1982, the International Plant Growth Substances Association Research Award in 1985, and the Outstanding Researcher Award from the American Society of Horticultural Science in 1992. He was named the University of California, Davis, Faculty Research Lecturer in 1992. In 1990 and 1992, he was elected to the National Academy of Sciences, USA, and to the Academia Sinica, Taiwan, respectively. In 1991 he received the prestigious international Wolf Prize in Agriculture.

After taking early retirement from the University of California in 1994, Shang Fa served as professor in the Department of Biology at Hong Kong University of Science and Technology from 1994 to 1997, where he established an active research group, and as a distinguished research fellow and the director of the Institute of Botany at Academia Sinica, Taipei, Taiwan. From 1996 to 1999, he was vice president of the Academia Sinica and directed its numerous research institutes.

Shang Fa is survived by his wife Eleanor and his two sons, Albert and Bryant, who have pursued careers in engineering and chemistry, respectively. His extensive network of friends throughout the worldwide community of scholars and scientists will miss him and regret his early passing. Although future plant biologists will know of Shang Fa through the Yang Cycle and his many other contributions to our field, students and colleagues who were fortunate enough to know him personally will also remember his humor, his humanity, and his sparkling intellect. He will be greatly missed.

Kent J. Bradford and Mikal E. Saltveit
University of California, Davis

Important Dates in 2007

July 5–7
Laboratory Leadership Workshop, Chicago, Illinois
http://www.aspb.org/meetings/pb-2007/labmanagement.cfm

July 7–11
Plant Biology & Botany 2007 Joint Congress, Chicago, Illinois
http://www.aspb.org/meetings/pb-2007/index.cfm

September (date to be determined)
Mid-Atlantic Section Crab Feast, ASPB Headquarters, Rockville, Maryland
http://www.aspb.org/sections/washington/meetings.cfm

Plant Biology 2008

Mérida, Mexico

Joint Annual Meeting

American Society of Plant Biologists
and
Sociedad Mexicana de Bioquímica
Rama: Bioquímica y Biología Molecular de Plantas

June 27-July 2, 2008

http://www.aspb.org/pb-2008

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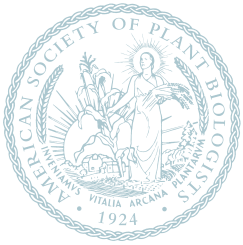

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