

ASPB News



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Nicholas Carpita Assumes Presidency October 1

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President's Letter

Steven Huber Is
President-elect

Gloria Muday Elected
to Executive Committee



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Nicholas Carpita, professor at Purdue University, is ASPB's new president. He succeeds Tuan-hua David Ho, Washington University in St. Louis, who became immediate past president on October 1. The Society's new president-elect is Steven Huber, USDA-ARS at the University of Illinois.

Nick is recognized for his expertise in the biology of the plant cell wall, from the structures of individual molecules and their biosynthesis, to the distinctive architectures of the cell walls of grass species, to the thousands of genes required for wall biogenesis and remodeling and the regulation of their expression. He is professor of plant biology at Purdue University and heads a Purdue initiative called the Energy Biosciences Research Community that aims to provide a national resource of research and education for the improvement of crops used in biofuels production, taking discoveries in plant biology into agronomic practice in a sustainable and environmentally sound way.

Nick grew up near Clearwater, Florida, where he became seriously interested in plant sciences his first year in high school. He obtained a degree in biological sciences at Purdue University in 1972 and a PhD in plant physiology at Colorado State University in 1977. His postdoctoral work from 1977 to 1979 with Deborah Delmer at the Department of Energy's Plant Research Laboratory at Michigan State University first kindled his interest in the biosynthesis of cellulose. He returned to Purdue University in 1979 as an assistant professor in the Department of Botany and Plant Pathology and became full professor in 1989. He was also a visiting



Nick Carpita

professor in the Plant Biology Institute in Zürich, Switzerland, from 1986 to 1987, returning as a guest professor in 1994, and he has been guest professor at the Botanical Institute of São Paulo, Brazil.

Nick's research interest is primarily the dynamic structure and function of the unique cell walls of grasses and related species, and he conducts research on the biochemical mechanism of synthesis of cellulose and other

β -glucans. He established that flowering plants make two structurally distinct types of primary walls, and his genome-wide analyses of grasses and Arabidopsis revealed the genetic bases for these distinctions. His recent work revealed the natural regulation of primary wall synthesis by small interfering RNAs from antisense transcripts of cellulose synthase genes. Translating these discoveries into improvements in lignocellulosic biomass as a feedstock for biofuels production has become a focus of his lab. He teaches an undergraduate course called "Plants and Civilization," which traces the history of agriculture and the broad impacts plants have on human civilization. He also teaches a graduate course on plant carbohydrate chemistry and various methods courses and research workshops for undergraduate honors students. He is recognized as an ISI highly cited author in the area of Plant and Animal Science.

Nick has been a member of ASPB since 1976. He served on the editorial board of *Plant Physiology* from 1987 to 1992 and as monitoring editor from 1998 to 2001. He also served as elected member of the Executive Committee (2002–2005) and as sec-



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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.

ASPB Executive Committee & Staff

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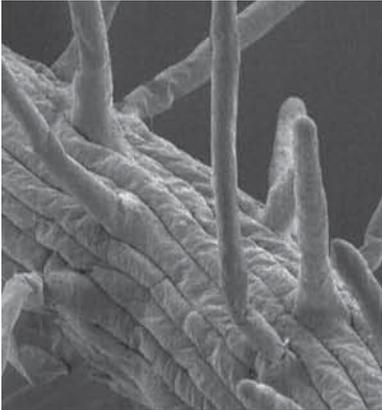
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Tuan-hua David Ho

President's Letter

Ongoing Business

My first experience with the American Society of Plant Biologists was attending one of its joint meetings with the Canadian Society of Plant Physiologists in Calgary, Canada, more than 30 years ago. I was a graduate student then, presenting my first paper at a scientific conference of this magnitude, and naturally was very nervous about my first encounter with many fellow plant biologists. Fast-forward in time, to another joint meeting with the Canadian society several weeks ago in Montreal, when I presided over the opening ceremony and chaired a symposium as president of ASPB. During the intervening three decades, I was not only fortunate enough to establish a career in research and teaching in plant biology, but also had the wonderful opportunity of attending many more ASPB meetings and participating in various functions of our Society. I truly appreciate the wide range of activities and opportunities ASPB offers, from education outreach to public affairs, from publication of highly acclaimed journals to organizing well-attended annual meetings. These efforts are always carried out in the true spirit of teamwork. In this last letter during my tenure as president, I would like to express sincere gratitude to those people who have been instrumental in making all these things happen. Also, during this transition period, I would like to take the opportunity to inform the ASPB membership at large about two important ongoing business issues.

The agenda of ASPB business is usually set by the Executive Committee, which consists of presidents, standing committee chairs, regional representatives, and elected members. The Executive Committee meets three times a year to discuss and decide on a wide range of issues, many of them brought forward by various standing committees. Ev-

ery Executive Committee member deserves our gratitude, but in particular, I would like to point out that all the standing committee chairs work extremely hard with their respective committee members on important activities of the Society, such as membership, publications, public affairs, minority affairs, education, and so on. I have attended many individual standing committee meetings and have been thoroughly impressed with the level of dedication and innovation. At each meeting, practical solutions were generated to solve problems facing the Society. All our committee chairs deserve a special citation for their service to our Society. One of them, Gary Stacey, University of Missouri, who heads the Public Affairs Committee, is rotating off this year after long and distinguished service to ASPB. Gary worked diligently with a can-do mentality in promoting the interest of ASPB and plant science in general at various gatherings with key people in government and Congress. A big "Thank You" goes to Gary! We are also grateful for Judy Brusslan, who will rotate off as chair of the Women in Plant Biology Committee, and Alan Jones, who has completed his three years of service as an elected member of the Executive Committee.

The ASPB business agenda is mostly carried out by the 20-plus staff working in the headquarters office in Rockville, Maryland. The ASPB staff is organized in different sections, such as publications, public affairs, finance and administration, and meetings/marketing/membership, each headed by a director who reports to the executive director, Crispin Taylor. All the staff members deserve our heartfelt gratitude for their dedicated and reliable service that drives the engine of our Society. Last year, Crispin wore an additional hat as acting director of public affairs when that position was unexpectedly vacated due to illness. Crispin and Gary worked very hard together not only to keep our public affairs activities rolling,

but to actually further expand our horizon in building additional contacts with several government agencies. Our sincere thanks go to Crispin for carrying out the extra responsibilities at a time of special need.

New initiatives are put forward each year by the ASPB leadership, and some of them may impact the Society for years to come. The two issues I would like to discuss in this letter as "Ongoing Business" are (1) the formation of a committee to study alternative business models for ASPB and (2) the continuous evolution of the Global Plant Council (GPC).

For years, ASPB has been able to support the gradual expansion of its portfolio of activities and services. This is primarily due to the surplus generated by our two successful journals, *Plant Physiology* and *The Plant Cell*. However, the recent government-led push for an Open Access/author-pays format in scientific publication will undoubtedly reduce the institutional subscription income generated by these two journals. Consequently, the current ASPB business model will eventually become unsustainable. In light of this concern, the leadership of ASPB has decided to form an ad hoc committee to study how we can best adjust and adapt to these new developments. The charges to this business development committee are to (1) define what fraction of the Society's income should be reassigned from subscriptions to something else and over what time frame, (2) articulate a mechanism for soliciting and robustly and expeditiously assessing plausible new revenue-generating ideas that come to the fore, and (3) identify a process for promoting and developing the most promising products and services. The committee will be composed of experts from both within and outside ASPB with experience in scientific leadership and administration and in the publishing business. There is no doubt that recommendations made by this committee will have a far-reaching

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President's Letter
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impact on future operations of ASPB. By the time this letter is published, this committee will be ready for action, and suggestions and comments from the ASPB membership at large will always be welcome.

As most of you know, the Global Plant Council (GPC) was formed last year in Hawaii as part of a historical and groundbreaking summit among more than a dozen major plant science societies around the world. The mission of the GPC is “to define and engage in coordinated strategies that impact the most critical issues facing humankind and to increase awareness of the central importance of plant science in solving these issues. Our shared vision and effort will enable more effective use of knowledge and resources, accelerating progress in solving the challenges of world hunger, energy, climate change, health and well-being, sustainability and

environmental protection.” The second GPC meeting took place right before the Montréal meeting this summer and was hosted by the Canadian Society of Plant Physiologists. Mel Oliver, USDA/University of Missouri, was elected executive director. Since it was Mel’s original idea that eventually led to the formation of the GPC, it seems quite fitting that he will continue overseeing the operation of this budding organization. His vision and effort will undoubtedly help shape the direction of the GPC. Our hats are off to Mel for all he has been doing for the GPC. Around 30 plant science societies are now GPC members. A provisional executive committee was also formed, and the ASPB representative will have a seat on this governing body. Furthermore, an action plan was established, and ASPB will continue to actively participate in GPC functions for years to come.

Before closing, I would like to give very special thanks to Sally Assmann, Pennsylvania

State University, the immediate past president, for her able leadership in guiding the Society over the past few years. Among her many accomplishments, she oversaw the major revamping of the ASPB website that was launched earlier this month, and she worked extremely hard to foster a dialogue between NIH and the plant science community. At the same time, please join me in welcoming Nick Carpita, Purdue University, to the presidency of ASPB and Steve Huber, USDA/University of Illinois, as president-elect. Both Nick and Steve have been highly dedicated ASPB members and have already served admirably in various capacities in our Society. Suffice it to say, “Ongoing Business”—and all that lies beyond—is in good hands. 🌿

Tuan-hua David Ho
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Nicholas Carpita
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retary (2005–2007). He is an avid promoter of ASPB’s role in international plant biology, education, and public awareness of the impact of plants on society and economic stability. He was responsible for initiating the Fellows of ASPB Award, inaugurated in 2007, and for co-organizing the ASPB-sponsored first Pan American Congress on Plants and Bioenergy

in Mérida, Mexico, in 2008 and the recently held second Pan American Congress on Plants and Bioenergy in São Pedro, Brazil. In 2003, he served as vice chair for the Gordon Research Conference on Cell Walls and as chair for the 2006 conference, and he has served on international steering committees for the International Cell Wall meetings. He has also served on the editorial boards of *Planta*, *Methods in Cell Science*, and the

Brazilian Journal of Plant Physiology, and he has been named to the editorial advisory panel for the new journal *Biofuels*. He has served on several competitive grants panels, USDA-NRI and DOE’s Energy Biosciences, and was a panel member and panel head for BARD’s Cell and Molecular Biology section from 1993 to 1998. 🌿

Access to Research for Development and Innovation

In March 2010, a new initiative from WIPO (UN World Intellectual Property Organization) called ARDI (Access to Research for Development and Innovation) asked that *Plant Physiology* join a select group of 150 scientific and technical journals to which patent offices will subscribe to gain accreditation from WIPO to grant patents and conduct searches. Access to *Plant Physiology* by these patent offices in developing nations is free, or at most \$1,000, because ASPB already partners with AGORA, HINARE, and OARE to give immediate free access to our research content to very poor countries worldwide. WIPO’s larger objective is to bolster the target countries’ applications to join the World Trade Organization. *Plant Physiology* is pleased to be selected for participation in this important outreach initiative. 🌿

Steven Huber Elected to Lead ASPB in 2011–2012

Steve Huber is a research scientist with the USDA–ARS at the University of Illinois. Steve received his BS degree from the University of Wisconsin in 1974 and completed his PhD degree in 1977 with Gerald Edwards, also at the University of Wisconsin.



Steven Huber

He then joined USDA–ARS as a plant physiologist and was located at North Carolina State University. In 1985–1986, he was a visiting professor at Nagoya University in Japan, and in 2000–2001 he served as review officer for the then newly formed ARS Office of Scientific Quality Review, where he provided scientific oversight of the peer review of ARS

projects. In 2003, Steve moved to the University of Illinois, where he is a member of the ARS Global Change and Photosynthesis Research Unit and adjunct professor in the Departments of Plant Biology and Crop Sciences.

A major focus of work in the Huber lab concerns the biological mechanisms that control primary carbon and nitrogen metabolism in plants. Steve and his colleagues

have a long-term interest in sucrose metabolism and nitrate assimilation and the control of these and other important plant processes by reversible protein phosphorylation. In particular, their studies have focused on the regulatory phosphorylation of key enzymes such as sucrose phosphate synthase, sucrose

synthase, and nitrate reductase. The work with nitrate reductase introduced the Huber lab to the so-called 14-3-3 proteins that function as phosphoserine-binding proteins and thereby interact with a wide array of cellular proteins. They are currently studying the binding of 14-3-3s to membrane proteins such as receptor kinases, where the 14-3-3s can function as positive regulators of signaling. A new aspect of receptor kinases that Steve's lab is studying is the role of tyrosine autophosphorylation. Recent results indicate that in addition to serine and threonine autophosphorylation, some receptor kinases can also autophosphorylate on tyrosine residues, which uncovers a previously unappreciated component of plant receptor kinases. Finally, the long-term interest in

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Gloria Muday Elected to Executive Committee

Gloria Muday joined the ASPB Executive Committee as an elected member on October 1. She earned a BS in biochemistry from Virginia Tech in 1984, and a PhD in biochemistry from Purdue University in 1989.

From 1989 to 1998, Gloria was a postdoctoral research associate with Sandoz Agro, Inc., in Palo Alto, California. In the Biology Department at Wake Forest University, she was assistant professor from 1991 to 1996, associate professor from 1996 to 2003, and professor since 2004. In addition, she has served as adjunct associate professor since 1999 in the Plant Biology Department at North Carolina State University, Raleigh.

Gloria's research and academic interests include regulation of auxin transport and dependent physiological processes including



Gloria Muday

root development and gravitropism, auxin-ethylene cross talk in root development and in gene expression networks, flavonoids as endogenous regulators of auxin transport and hormonal controls of flavonoid biosynthesis through transcriptional regulation of genes in the phenylpropanoid pathway, environmental regulation of root architecture, mechanisms for

targeting of auxin transport proteins to appropriate membrane domains as visualized through confocal imaging of GFP fusion proteins, and regulation of auxin transport through reversible protein phosphorylation.

Her professional activities and awards include cochair, Gordon Research Conference on Mechanosensory Transduction (July 2007); co-vice chair, Gordon Research Conference on Mechanical and Gravity Signal

Transduction (2005); USDA panel manager and panel member for Crop Plant Growth and Development; panel member at NSF, Plant Genome, Graduate Research Fellowships, Processes, Structure, and Integrity; NASA, Plant Biology panel member; and American Society of Gravitational and Space Biology, Thora Halstead Young Investigator Award (1999) and member of Governing Board (2000–2004). She is also an ad hoc reviewer for *The Plant Cell*, *Plant Physiology*, *The Plant Journal*, *Journal of Biological Chemistry*, *Journal of Experimental Botany*, and *Trends in Plant Science*.

Gloria has been a member of ASPB since 1988. She was monitoring editor for *Plant Physiology* from 1998 to 2000, a member of the Corresponding Membership Award Committee from 1994 to 1998 and 2006 to present and chair since 2007, and the ASPB SURF Fellowship mentor in 2009.

Steven Huber
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regulation of protein kinase specificity has resulted in a second new area of work dealing with the impact of reactive oxygen on protein phosphorylation and the emerging notion that methionine oxidation can function as a redox switch directly linking ROS signaling to phosphorylation. Steve's lab also has a long-standing interest in soybean seed composition and is currently studying how pod position along the mainstem affects the relative content of protein and oil.

At Illinois, Steve has taught plant physiology and metabolism and currently teaches a graduate-level course on plant proteomics.

His professional duties have included serving on grant panels for NSF, NRI, and DOE and several journal editorial boards. He currently serves on the boards for *Planta*, *Photosynthesis Research*, and Faculty of 1000 and is a deputy chair of *The Biochemical Journal*. Steve was recognized as an ISI highly cited researcher in Animal and Plant Sciences in 2000 and was elected a fellow of AAAS (American Association for the Advancement of Science) in 2007, a fellow of ASPB in 2007 (inaugural class), and a fellow of the Agronomy Society of America and Crop Science Society of America in 2000. He has been an active member of ASPB since 1975, and has served as a board member and monitoring

editor of *Plant Physiology*. He has also served as a member of the Shull Award Committee, chair of the Martin Gibbs Award Committee (2009–2013), chair of the Stephen Hales Prize Award Committee (2009–2012), chair of the Constitution & Bylaws Committee (2009–2010), and elected member of the Executive Committee (2007–2009). In 2008, he was awarded the Lawrence Bogorad Award for Excellence in Plant Biology Research. Steve has volunteered in the Education Booth at ASPB and AAAS annual meetings and is an avid supporter of the role of the Society in education and public awareness of important issues.

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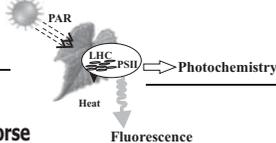
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Information About All Programs

Purpose, scope

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Applicants may be residents of the United States or American citizens resident abroad. Foreign nationals whose research can only be carried out in the United States are eligible. Grants are made to individuals; institutions are not eligible to apply. Requirements for each program vary.

Tax information

Grants and fellowships are taxable income, but the Society is not required to report payments. It is recommended that grant and fellowship recipients discuss their reporting obligations with their tax advisors.

Contact information

Questions concerning the FRANKLIN and LEWIS AND CLARK programs should be directed to Linda Musumeci, Director of Grants and Fellowships, at LMusumeci@amphilsoc.org or 215-440-3429.

Brief Information About Individual Programs

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Scope

This program of small grants to scholars is intended to support the cost of research leading to publication in all areas of knowledge. The Franklin program is particularly designed to help meet the cost of travel to libraries and archives for research purposes; the purchase of microfilm, photocopies or equivalent research materials; the costs associated with fieldwork; or laboratory research expenses.

Eligibility

Applicants are expected to have a doctorate or to have published work of doctoral character and quality. Ph.D. candidates are not eligible to apply, but the Society is especially interested in supporting the work of young scholars who have recently received the doctorate.

Award

From \$1,000 to \$6,000.

Deadlines

October 1, December 1; notification in February and April.

Lewis and Clark Fund for Exploration and Field Research

Scope

The Lewis and Clark Fund encourages exploratory field studies for the collection of specimens and data and to provide the imaginative stimulus that accompanies direct observation. Applications are invited from disciplines with a large dependence on field studies, such as archeology, anthropology, biology, ecology, geography, geology, linguistics, and paleontology, but grants will not be restricted to these fields.

Eligibility

Grants will be available to doctoral students who wish to participate in field studies for their dissertations or for other purposes. Master's candidates, undergraduates, and post-doctoral fellows are not eligible.

Award

Grants will depend on travel costs but will ordinarily be in the range of several hundred dollars to about \$5,000.

Deadline

January 15; notification in May.
Information updated July 2010.



Bonjour and Bienvenue!

Highlights from Plant Biology 2010

JOINT ANNUAL MEETING OF THE AMERICAN SOCIETY OF PLANT BIOLOGISTS AND
THE CANADIAN SOCIETY OF PLANT PHYSIOLOGISTS—LA SOCIÉTÉ CANADIENNE DE PHYSIOLOGIE VÉGÉTALE



With a pinch of European flair and a splash of metropolitan sophistication, Montréal serves up the perfect “broth” for those seeking a getaway in the city. However, as this grand metropolis played hostess for Plant Biology 2010, a handful of chloroplasts and a smidgen of *Arabidopsis* DNA made Montréal’s “broth” of attractions a little greener than usual.

Plant Biology 2010—a joint meeting of ASPB and the Canadian Society of Plant Physiologists (CSPP)—was held July 31 to August 4 in an environment rich with discussion of the latest breakthroughs in plant science. Joining the many ASPB members who trekked north were scientists from 44 other countries, for a final attendee count of 1,426.

By offering an agenda filled with symposia, poster sessions, and industry and academic networking events, Plant Biology 2010 welcomed a diversified global population of plant biologists and enthusiasts. A broad spectrum of researchers, from under-

graduate students to highly distinguished professors, convened to share their latest research developments and take advantage of the informational sessions to improve their research and study.

This year’s convention commenced with the ASPB and CSPP Awards Ceremony, where ASPB President Tuan-hua David Ho welcomed a diverse group of attendees and recognized PB2010 as a collaborative effort between the two sister plant societies. CSPP President Carl Douglas first acknowledged the Canadian society’s award winners, turning the ceremony over to President Ho for the presentation of the ASPB awards. More than 20 honorees received recognition, ranging from the Adolph E. Gude, Jr. Award, which notes an outstanding contribution to plant biology, to the Early Career Award, which honors exceptional creativity and independent societal contributions to people not exceeding five years post-PhD. (For more detailed information about the 2010

ASPB awards and recipients, please visit the ASPB awards page at <http://www.aspb.org/awards>.)

After the opening address, Steven Jacobsen from the University of California, Los Angeles, delivered the Charles Albert Shull Award Winner Lecture on DNA methylation in *Arabidopsis*. This award recognizes a young scientist with an inquiring spirit and zeal for his or her work in the field of plant biology. The Shull Award honors Dr. Charles Albert Shull for serving as one of ASPB’s earliest supporters and as the first editor of *Plant Physiology*. Steven investigates the genetics of *Arabidopsis thaliana* through studying cytosine DNA methylation and gene silencing. Typically, cytosine DNA methylation results in a heritable suppression of gene transcription, indicating that methylation might act as a defense mechanism of the genome. Since *Arabidopsis* exhibits developmental abnormalities from mutations that would normally eliminate methylation in another



organism's genome, the plant serves as a prime model for Steven's lab to examine mutants that affect DNA methylation. In his lecture, Steven questioned the inheritance patterns of methylation and revealed the three different pathways for cytosine methylation: CG methylation, CHG methylation, and CHH methylation. While initial DNA methylation requires DNA methyltransferase DRM2 enzyme (homologous to mammalian Dnmt3), the upkeep of preexisting methylated sites through the CG methylation pathway requires the main enzyme DNA methyltransferase MET1 and the cofactor ORTH2/VIM1, both of which are homologous to mammalian Dnmt1 and UHRF1, respectively. The CHG and CGG methylation pathways differ from the previous pathway in that the CHG methylation requires DNA methyltransferase CMT3, whereas the CGG pathway functions by continuous targeting of DRM2 and small interfering RNAs.

“Cocoon of Fear”: The GMO Debate

The opening address and awards ceremony concluded with what seemed to be one of the hot topics of this year's conference—genetically modified organisms in the public spotlight. The 2010 recipient of the

ASPB Leadership in Public Service Award, Nina Fedoroff, took the podium to deliver a lecture titled, “On the Front Lines of the Global GMO Debate.” As a pioneer in the field of plant and molecular biology, Nina has contributed greatly to the development of modern techniques for modifying plants. She publicly promotes the scientific perspective on the advantages of using genetically modified organisms for crop improvement while serving as science and technology adviser to U.S. Secretary of State Hillary Clinton.

Public concern about the safety of GMOs continues to grow, but Nina stated that the economic benefits of GMOs outweigh the negative repercussions of using such a powerful molecular tool. Classifying organic farming to be less efficient, less productive, and more expensive than traditional farming, she touted the economic benefit of wide use of GMOs to be roughly \$9 billion, with a cumulative benefit in excess of \$50 billion.

Nina discussed the inappropriate regulations that continue to impede the introduction of GM crops on a broad scale. Although “golden rice” has increased concentrations of beta carotene and can help decrease the vitamin A deficiency in communities relying on rice as a staple food, the horticulture of golden rice remains a scientific dream because public fear and disapproval have encumbered the rice's release to farmers. Nina concluded her dynamic lecture by reiterating the need for the public to escape its “cocoon of fear.” She encouraged plant scientists to persevere and live by a few simple words of wisdom: “Patience. Keep researching and explaining. Humanity needs your help.”

Industry vs. Academia: Choosing the Right Path to Success

In addition to offering attendees an array of science-oriented symposiums, Plant Biology 2010 presented young scientists with a glimpse of careers in both academia

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and industry. The career workshop “Is Industry the Right Choice for You?” provided a forum for discussion about plant science careers in industry. In a post-dinner talk, Crispin Taylor, ASPB’s executive director, advised graduate and postdoctoral students of the key demands that apply to success in management. Although a mastery of scientific skills will jump-start a successful career in the field of plant biology, Crispin advocated honing one’s skills in critical thinking, project management, attention to detail, time management, public speaking, writing, and networking.

Following Crispin’s address, Elizabeth Hood, from Arkansas State University, discussed the dissimilarities between a career in industry and a career in academia. Beth now serves as Arkansas State’s associate vice chancellor for research and technology, but she did not always have stability in her career. As a full-time member of a start-up company in earlier years, she explained that she faced the risk for failure on a daily basis. A successful start-up company, unlike the individual-based study often associated with academia, requires everyone to focus on the same goal at hand and work as a team. After emphasizing to the audience the importance of being willing to take risks throughout a

career, Beth concluded her talk by calling attention to the evolution of the academic career, stating that the most successful academic researchers have an industry-driven mindset.

The lectures concluded by highlighting the motivation behind a career in industry or academia. Many scientists migrate toward a career in the academic arena because of a higher prevalence of publications produced from scholarly institutions than from industrial companies. When faced with a career opportunity in academia or industry, scientists must realize that “Perception does not meet reality. Industry focuses on making products, not publications.”

Polyploidy, Heterosis, and Genomic Plasticity

While Montréal’s locals got in a few extra hours of sleep or enjoyed a leisurely Sunday brunch, conference-goers indulged in a

Sunday morning symposium organized by Z. Jeffrey Chen from the University of Texas at Austin, which featured Loren H. Rieseberg. Loren, from the University of British Columbia, addressed the role of hybridization in evolution. Hybridization may lead to genetic diversity and acquisition of novel adaptations; however, some view hybridization as an event with little evolutionary significance. The limited support for either viewpoint prompted Loren’s discovery of a new method for identifying recent and ancient hybrids through analysis of a single genome.

Loren informed the audience of the necessity for uncovering the historical context of hybridization. Through observation of polyploidy speciation in the environment, he has revealed that nearly 15% of flowering plants and nearly 31% of ferns have undergone polyploidy speciation. This polyploidy speciation analysis has allowed for the discovery of hybridiza-



tion prevalence through analysis of a single plant genome, revealing that hybridization occurs more frequently than previously anticipated.

On a related note, Pamela S. Soltis, from the University of Florida, presented her research on polyploidy in *Tragopogon*. She has used natural models of *Tragopogons mirus* and *Tragopogons miscellus* originating from eastern Washington and Idaho to examine the genetic and genomic effects of polyploidization; however, both species did not exist in North America before European settlement. Homeolog loss and homeolog silencing observed in tetraploid forms of *Tragopogon* have led Pamela to conclude that a substantial amount of evolutionary change has occurred in the short amount of time since *Tragopogon*'s inhabitation within North America.

Finding the “Third Way”

Some sociological studies insinuate that women may have to make sacrifices to have both a successful career and a family. Shirley Malcom, the keynote speaker for the Annual ASPB Women in Plant Biology Luncheon, urges female scientists to find the “third way” in order to have both a

family and a career. Shirley referenced the words of Nancy Hopkins, who called herself “a nun of science,” and proposed that women in science may benefit from having a role model to help them navigate a career path that does not always accept the idea of having your cake and eating it too.

If one strategizes and makes the most of the connections and information they can obtain through their professional society, the individual—whether male or female—will acquire the skills needed for a successful career. Shirley further reiterated the importance of planning when she encouraged women in the plant community to “not go for 50%.” Instead, “accept the full-time job” and then negotiate the conditions that will allow for a family life outside of academia.

As the head of the Directorate for Education and Human Resources Programs of the AAAS, Shirley understands the importance of distinguishing your achievements in the scientific world. “Big things mean more to me,” Shirley said. “Yes, women may put out fewer scientific publications, but they have a greater impact. The third rail powers you. Know who you are and be honest with yourself about what works to keep you in the game.”

Undergraduate Research: A Glance into the Future of Plant Biology Researchers

Plant Biology 2010 provided undergraduates with an opportunity to present their research to an eager and knowledgeable audience. Undergraduate students presenting their research accomplishments to conference attendees had the ideal setting in which to advance their skills in networking and professional protocol while also receiving recognition for their commendable triumph in the academic arena.

Francisca Villar, from Lehman College of the City University of New York, enthusiastically presented her results from an investigational study of “Phototolerance to Toxic Heavy Metals by American and International Rice *Oryza Sativa* Cultivars In Vitro: Implications of Remediation of Contaminated Sites.”

In her research, Francisca examined rice phytotolerance to heavy metals that contaminate the water used for crop irrigation. She explained that her personal experience with her grandmother’s battle against Alzheimer’s disease served as the driving force for her interest in crop exposure to heavy metal toxins.

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“Originally, I wanted to be a doctor because of my experience with the Alzheimer’s disease that affected my grandmother,” she said. “When I got to college, I learned about how plant research can be used to further develop aspects of investigation into human disease. My particular research focuses on the association between heavy metals and the onset of Alzheimer’s disease. We knew that Itai-Itai disease [which causes a softening of the bones] has been specifically linked to heavy metal contamination of rice crops, but we wanted to know the specifics behind the presence of heavy metals in the rice.”

Her lab observed the chlorophyll content of rice from three continents to quantitatively analyze the effect of heavy metals on rice crops. Of A-301 rice cultivars from Japan, IR36 rice cultivars from North America, and B217 rice cultivars from

India, the A-301 type cultivars exhibited the most resilience to heavy metals, whereas the primary rice cultivars found in both North America and India did not survive. Francisca’s poster reveals that A-301 rice cultivars successfully removed cadmium and zinc from the soil.

“Considering A-301 rice cultivars’ ability to successfully remove heavy metals from the soil, we now want to test the prospect that this rice could operate as a candidate for phytoremediation,” Francisca said.

The Next Wave of Plant Biotechnology

After dedicating four days to spotlighting the current trends of plant science and research, Plant Biology’s closing symposium (ASPB President’s Symposium) on Wednesday, August 4, provided attendees with a preview of the future of plant science. ASPB President Tuan-hua David Ho’s

opening remarks distinguished the difference between the research of yesteryear and the present day by stating that a clear line once separated basic research and applied research, but now a merging of the two types of research has blurred that line into nonexistence.

Scientists have evolved their focus in plant biotechnology. Centuries ago, plant breeding held center stage, but then the concentration turned to tissue cell culture and plant regeneration. The current focus of plant research revolves around DNA and plant genetic transformation; however, this too will soon come to end. Thus, the inevitable question arises: “What’s next?” The answer: continued advancement of plant biotechnology through promoting the wide usage of GMOs in agriculture.

When organizing this final symposium, David wanted to equate different geographic perspectives and find a balance between industry and academia. The major symposium united Roger Beachy from NIFA/USDA and Danforth Plant Science Center, Wilhelm Grüssiem from the Swiss Federal Institute of Technology, Paul Quick from



the International Rice Research Institute, Vipula Shukla from Dow Agrosience, and David Fischhoff from Monsanto Company.

Roger Beachy's lecture seemed to pick up where Nina Fedoroff's discussion ended just a few days prior. As the new director of the National Institute of Food and Agriculture (NIFA), Roger devotes much of his time to finding solutions for societal challenges through research in food and agriculture. He noted challenges with energy consumption, environment, and health and compared the next wave of biotechnology to a crest that must support the weight of success.

To ensure that scientists do not hurtle into the metaphorical rocks residing underneath the crest of plant biotechnology, Roger promotes the idea of team-driven research rather than individual science exploration. Additionally, a need for scientists to connect with the public will aid to increase acceptance of using agricultural biotechnology. In the end, the public will ultimately decide the fate of transgenic products.

Willi Gruissem's lecture on crop improvement and biofortification offered the European perspective on GMOs. Willi issued a plea to scientists trying to understand our

past to begin investigation of the science that will guarantee the present and future of the planet.

Global food security poses a larger threat to the public on a daily basis; thus, scientists must battle the "perfect storm" arising from this agricultural deficit. Although he voiced his concern for Europe's narrow acceptance of GMOs, Willi emphasized that the problem with food security threatens the world, not just a select group of territories.

He concluded his lecture with four key issues that scientists face in the global debate on GMOs: the urgent need to address the world's health and food-security needs, implementing the knowledge gained from past and present breeding programs, generating public trust in novel traits, and investing in research and development to develop new crops.

Au Revoir, Plant Biology 2010

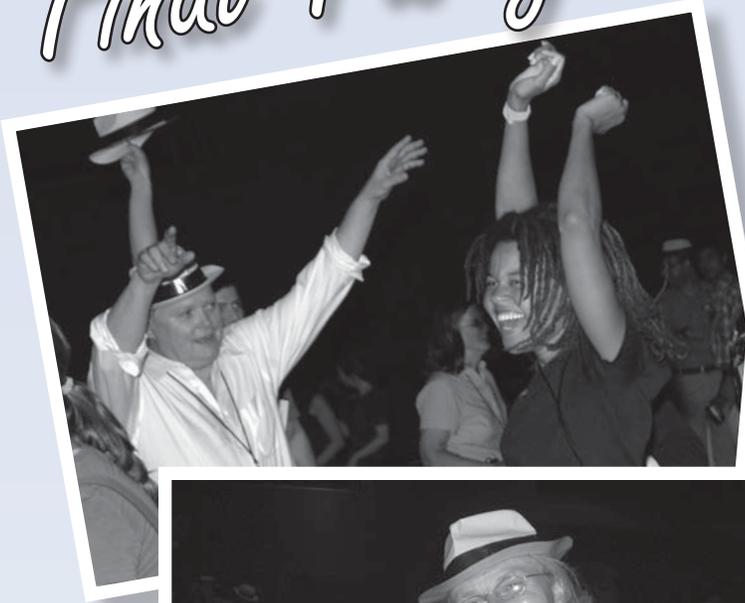
Overall, Plant Biology 2010 provided an environment for linking industry, academia, and the hottest emerging topics in plant science. But even more important, the meeting zeitgeist was refreshingly open, with several attendees noting the willingness of presenters—whether in plenary symposia, concurrent sessions, or at the posters—to share newly generated data and ideas. Such candor and openness surely help the plant biology community to advance knowledge and, thereby, better serve humanity.

Be sure to join us next summer for Plant Biology 2011 in Minneapolis, Minnesota! 🌱

Sarah Ousley
University of Texas
College of Natural Sciences
BS Human Biology Student



Final Party!





Montréal, Canada



Award Honorees at Plant Biology 2010

Congratulations to the winners of this year's ASPB awards. The following presentations were made during the Saturday, July 31, ASPB Awards Ceremony in Montréal, Canada.



2010 award winners (back row, from left): R. Keith Slotkin, Norman Hüner (CSPP), Patrick Boyle (CSPP), Wayne Snedden (CSPP), Ralph Quatrano, Gary Stacey, Stan Roux, Alice Cheung, Mark Brodl, Jane Ellis. (front row, from left) Athanasios (Sakis) Theologis, Nam-Hai Chua, J. Derek Bewley, Ashley Galant, Sabeeha Merchant, A.S.N. Reddy, Elizabeth Hood, Sudhir K. Sopory.

Adolph E. Gude Jr. Award

This monetary award honors the Gude Family, who made possible the establishment of the Gude Plant Science Center. The award, established by the Society and first given in 1983, is made triennially to a scientist or lay person in recognition of outstanding service to the science of plant biology.

Ralph Quatrano

Ralph Quatrano's scientific contributions and his multifaceted and stimulating service to the plant sciences community in the United States and around the world are extensive. Ralph's scientific contributions have been distinguished. He has published, and continues to publish, major influential papers in the fields of cell polarity, abscisic acid signaling, and genomics, including recent publications on desiccation tolerance in *Physcomitrella patens* (*Science*, 2010) and as corresponding author on the completion of the *Physcomitrella patens* genome sequence (*Science*, 2008). His research on cell polarity has earned him widespread

recognition beyond the boundaries of the plant biology community.

Ralph's efforts to ensure excellence, fairness, and broad representation of many fields in plant biology have had a strong and lasting influence across ASPB and the plant sciences in general. Ralph played an important role in shifting the plant biology field into the limelight from the late 1980s through today, through his work as scientist, as ASPB president, as editorial board member for *Science*, and as editor in chief of *The Plant Cell*, as well as through many other consensus-building activities. Ralph was one of the original members of the editorial board of *The Plant Cell* starting in 1989, and he served as its chief editor from 1998 to 2003, expanding the scope and impact of ASPB's flagship journal during this entire time. He was ASPB president in 1992–1993 and during that time created the Office of Public Affairs to promote the visibility and funding of plant science. Subsequently, he served as the first chair of the ASPB Public Affairs Committee from 1994

to 1997, testifying regularly before Congress on behalf of plant biology research. He began his service to professional societies and boards as treasurer of the Society for Developmental Biology from 1981 to 1984. From 1991 to 1994, he served on the Society's Executive Committee. He has also devoted considerable energy throughout his career to service on editorial boards, including the board of *Annual Review of Plant Biology*, and grant review panels at NSF, USDA, and many NIH study sections.

In addition to his national and international efforts, Ralph has left a legacy of excellence in research and in building powerhouse programs at each of his home institutions, including Oregon State University (until 1986), as research manager at Dupont (1986–1989), as chair of biology at the University of North Carolina at Chapel Hill (1989–1998), and as Biology Department chair and dean at Washington University in St. Louis since 1998. He has been very supportive of young plant scientists around the globe in many areas of

plant biology. He has offered this support in a quiet and easygoing way and always with the necessary ingredient—humor. His support of plant biologists has been selfless and refreshing and has benefited the entire plant biology community.

ASPB–Pioneer Hi-Bred Graduate Student Fellowship

This award, made possible by the generosity of Pioneer Hi-Bred International (<http://www.pioneer.com>), recognizes and encourages innovative graduate research and innovation in areas of plant biology that relate to important commodity crops. One \$22,000 fellowship will be given annually from 2010 through 2013, with an additional \$1,000 awarded for the recipient to attend the ASPB annual meeting in the year of their award. Each nominee must attend a U.S.-accredited college or university and must demonstrate interest in the study of plant biology or a related discipline. Each nominee must be a PhD candidate (i.e., have successfully passed their preliminary examinations), must demonstrate an excellent academic record, and must be a member of ASPB. An individual may receive this prize only once.

Ashley Galant

Ashley Galant is the 2010 recipient of the ASPB–Pioneer Hi-Bred Graduate Student Fellowship. Ashley is a PhD student in the plant biology graduate program at Washington University in the laboratory of Dr. Joseph Jez at the Donald Danforth Plant Science Center. She studies oxidative stress in soybean, an important crop plant that is especially sensitive to ozone. Her dissertation research focuses on understanding how oxidative stresses alter the structure and function of soybean proteins. She studies the soybean enzyme homoglutathione synthetase (hGS), which regulates synthesis of homoglutathione, a peptide that buffers the cellular redox environment. Using X-ray crystallography, Ashley solved the structure of hGS in several different forms. Her work, which was recently published in

The Plant Cell, provided important information about the evolution and substrate specificity of hGS. She is now using proteomics approaches to identify proteins that are structurally altered following oxidative stress. This project has required her to develop some new protein labeling methodologies. Her research to define the “redox proteome” is expected to result in an increased understanding of how plants respond to oxidative stress. Ashley has a strong interest in intellectual property and technology transfer. She hopes to ultimately work where academic and industrial science interface, perhaps as a technology transfer liaison.

Charles Albert Shull Award

Created in 1971 to honor the Society’s founding father and the first editor-in-chief of Plant Physiology, this award is designed to recognize young researchers. It is a monetary award made annually and is given for outstanding investigations in the field of plant biology by a scientist who is under 45 years of age on January 1 of the year of presentation, or who is fewer than 10 years from the granting of the doctoral degree. The recipient is invited to address the Society at the annual meeting the following year.

Dominique Bergmann

Dominique completed her PhD in 2000 working at the University of Colorado, Boulder, on developmental axis formation in *C. elegans*. It was through this work that she established her current interest in understanding cell polarity and asymmetric cell division and their relationship to cell fate. She took this interest to Chris Somerville’s lab at the Carnegie Institution in the Department of Plant Biology at Stanford University for her postdoctoral fellowship. As a postdoctoral fellow, she established her focus on asymmetric divisions during stomatal development. In 2005, she was appointed as assistant professor in the Department of Biology at Stanford. In her own laboratory at Stanford, Dominique not

only defined a suite of transcription factors that control the development of stomata, but she has also shown how these factors are modulated by the MAP kinase cascade. “I know of no other developmental system in plants where the two processes have been linked up so well,” one supporter wrote. Overall, Dominique’s contributions during the past five years have influenced not only our understanding of stomatal development, but more generally of cell fate and patterning in plants and in other multicellular organisms.

More specifically, Dominique elucidated the roles of three basic helix-loop-helix (bHLH) transcription factors that are specifically expressed in stomatal lineage cells and act sequentially as positive regulators of stomatal formation: SPCH, which promotes meristemoid formation; MUTE, which promotes the asymmetric divisions that subsequently amplify the stomatal lineage; and FAMA, which promotes the symmetric division that creates guard cell pairs. Sequentially acting bHLH proteins had previously been shown to regulate cell fate in neuron and muscle development in animals, but never before in plants, where Dominique has made spectacular progress in understanding stomatal patterning.

Dominique’s next significant accomplishment was to elucidate a mechanism for integration of positive and negative regulatory pathways. Her lab showed that SPCH can be phosphorylated *in vitro* by MAPKs 3 and 6 (the “endpoint” of the negative regulatory pathway) within a small domain that distinguishes SPCH from the otherwise very similar bHLH proteins MUTE and FAMA, and that phosphorylation of this domain is critical for SPCH function *in vivo*. This discovery provides a mechanism by which the earliest acting positive regulator of stomatal formation, SPCH, can be down-regulated by extracellular signals transduced by a MAPK cascade (the negative regulatory pathway). It also provides insights into the general problem of how a



MAPK pathway that impacts many processes can act in one specific process (stomatal development) via phosphorylation of a temporally and spatially localized effector (the unique domain of SPCH).

Dominique has made other notable contributions as well. Her group contributed to the discovery of a putative ligand for the negative regulatory pathway EPF1. They also identified a regulator of root vascular development, a novel regulator of asymmetric cell division, and two tissue-specific regulators of stomatal patterning. Dominique has also analyzed the role of orthologs on the bHLH transcription factors in grasses and moss.

Mainly thanks to her work, the stomatal pathway can now be considered to be the best worked-out pathway for stepwise cell specification and restriction of developmental potential. Accordingly, her work is exclusively published in top-ranking journals. Two statements by supporters sum up her contributions: “The identification of a transcriptional network and its emerging connections to upstream signaling factors in this process is not just of temporary interest, but will be textbook material for many years to come.” And, “she has made stomatal differentiation the most completely understood model for cellular differentiation in plant biology.”

Charles F. Kettering Award

This award was established by an endowment from the Kettering Foundation in 1962 to recognize excellence in the field of photosynthesis. It is a monetary award to be given in even-numbered years to an individual for meritorious work in photosynthesis.

Sabeeha Merchant

Sabeeha Merchant has made multiple major discoveries. Early on, she established the functional equivalence of cytochrome c_6 and plastocyanin and described the molecular basis of their “either/or” pattern of expression where iron-containing cytochrome c_6 serves as a “backup” in a copper-deficient environment for copper-containing plastocyanin in photosynthesis. This finding

represents one of the earliest examples of trace metal-regulated gene expression to provide metabolic flexibility in nature. Today, the concept of backup metabolic routes, as proposed by Sabeeha, is well appreciated and recognized by chemists, biologists, and oceanographers. A few years later, a genetic tour de force led to the discovery of novel thylakoid membrane proteins that participate in the assembly of cytochromes c . Subsequent analyses of the genome databases indicate that these proteins, named CcsA and Ccsl, are characteristic molecules that define one of three genetically distinct routes to holocytochrome formation. Then, in yet another area of research, Sabeeha identified a long-sought-after enzyme in the chlorophyll biosynthetic pathway—MgProtoporphyrin IX monomethylester cyclase, or CHL27—which is responsible for the synthesis of protochlorophyllide. Most recently, she has been recognized for coordinating the Chlamydomonas genome project, including the startling discovery (in collaboration with two co-principal investigators) of hundreds of new proteins that function in photosynthesis and chloroplast biogenesis.

Charles Reid Barnes Life Membership Award

This is the oldest award, established in 1925 at the first annual meeting of the Society through the generosity of Dr. Charles A. Shull. It honors Dr. Charles Reid Barnes, the first professor of plant physiology at the University of Chicago. It is an annual award for meritorious work in plant biology; it provides a life membership in the Society to an individual who is at least 60 years old. Membership is not a requirement for the award, and if appropriate, every fifth award should be made to an outstanding plant biologist from outside the United States.

J. Derek Bewley

J. Derek Bewley is a quintessential plant physiologist whose research interests range from desiccation tolerance in

mosses to investigations of dormancy mechanisms in seeds. Derek obtained his PhD degree from Queen Elizabeth College, University of London, in 1968. After a post-doctoral with Abe Marcus in Philadelphia, he was appointed assistant professor at the University of Calgary in 1970. In 1985, he was appointed professor and chair of botany at the University of Guelph, becoming university emeritus professor in 2006. His interest in seed dormancy began as a PhD student, and he is arguably best known for his work in this area. His reputation is established by his seminal contributions to our knowledge of the role of the endosperm in seed dormancy, but many also know him from his influential books on seed germination. Derek carried out groundbreaking research on desiccation and rehydration using the moss *Tortula* as a model system. He later extended these investigations to angiosperms and helped unravel the role of abscisic acid in the dehydration response of seeds. He has received many awards for his outstanding contributions to plant biology, including election to the Royal Society of Canada, the Gleb Krotkov Award of the Canadian Society of Plant Physiologists, and election as a corresponding member of ASPB.

Corresponding Member Award

This honor, initially given in 1932, provides life membership and Society publications to distinguished plant biologists from outside the United States. The honor is conferred by election on the annual ballot. The committee selects no more than three (3) candidates, and these are placed on the ballot for approval of corresponding membership by majority vote. The president notifies successful candidates of their election. Election of a corresponding member is to be considered each year, and held if warranted, provided the election will not increase the number of corresponding members beyond two (2) percent of the dues-paying membership.

Geoffrey B. Fincher

Geoffrey B. Fincher is a professor at the University of Adelaide and has an outstanding record of achievement for his research into the biochemistry of plant cell walls. Research in Geoffrey's laboratory has focused on the biology of cell walls in cereal grains and has included investigations of the chemical and physicochemical properties of cell wall polysaccharides; the purification and characterization of enzymes responsible for the hydrolysis of major wall constituents; the developmental patterns of these enzymes; and, more recently, their genetics, molecular biology, and X-ray crystal structure. He has also contributed to the development of research through his role as cofounder of the Australian Centre for Plant Functional Genomics and the Australian Plant Phenomics facility.

Geoffrey received his undergraduate and PhD degrees from the University of Melbourne. He was a postdoctoral fellow at McGill University and the Brewing Research Foundation and was visiting scientist at Carlsberg Laboratory, Denmark; the Sainsbury Laboratory, United Kingdom; and CERMAV-CNRS, Grenoble, France. At the University of Adelaide, he has served as professor, associate dean of research, head of the Department of Plant Sciences, and deputy dean for the Faculty of Science. He is currently the director of the Waite Agricultural Research Institute and deputy CEO of the Australian Centre for Plant Functional Genomics. He has also served as the director of the CSIRO Flagship Cluster on Healthy Complex Cereal Carbohydrates. Geoffrey has been a member of ASPB for more than 20 years and served two separate terms as monitoring editor of *Plant Physiology*, as well as in editorial roles at journals including *Plant Molecular Biology*, *Planta*, *BioEnergy Research*, and the *Journal of Cereal Science*.

Hartmut Lichtenthaler

Hartmut Lichtenthaler has been a professor at the University of Karlsruhe, Germany, for

more than 30 years. He has made major contributions to the fields of photosynthesis, especially pigment dynamics, light acclimation, and stress physiology. His research has had an impact in the fields of lipids, tree physiology, and natural products/secondary metabolites. In 1983, he led a study on the physiological events of forest trees in the context of the "new forest decline" in Europe. He participated in the development of new remote sensing technologies to classify the forests on the basis of airborne information, which helped provide insight into the death of trees across Europe. In recent years, he has identified important enzymes in isoprenoid biosynthesis in plants. He has published more than 380 research articles and reviews in journals and books. He has been widely recognized in Europe for his work, receiving three honorary doctorates; three medals of merit from scientific societies; and "Bundesverdienstkreuz am Bande," the highest scientific tribute that is awarded in Germany.

Hartmut received his PhD in botany from the University of Heidelberg in 1961. He completed postdoctoral research at the University of California with Professor Melvin Calvin before joining the faculty at the University of Münster and later the University of Karlsruhe, where he has served as head of the Botanical Institute. He was a member of a group that laid the foundation for the Federation of European Societies of Plant Biology and helped the organization achieve major influence and develop ties with other plant-oriented societies. He has served on numerous editorial boards including *Photosynthesis Research*, *Physiologia Plantarum*, *Journal of Plant Physiology*, and *Tree Physiology*. He has promoted the exchange of young scientists to Germany from the United States and has been an active member of ASPB for more than 40 years.

Sudhir K. Sopory

Professor Sudhir K. Sopory is a highly recognized and decorated plant biologist in the

fields of molecular plant physiology and plant biotechnology. He has made seminal discoveries in understanding the mechanisms of light and stress regulation of gene expression in plants. He identified phytochrome-mediated regulation of enzymes in nitrate assimilation and demonstrated phosphoinositide signaling in light-mediated expression of genes. He has also dissected stress signal transduction events and developed transgenic plants tolerant to abiotic stresses, including salt and drought. He has published over 190 papers in international journals and 50 book chapters. He is a fellow of the World Academy of Sciences, the Belarus Academy of Sciences, and the Indian Academy of Sciences.

Sudhir received his BS and MS degrees from J & K University and a PhD degree from the University of Delhi. He completed postdoctoral training at the Max-Planck Institute for Zuchtungsforschung, Koln, Germany; the University of Texas at Austin; and the Plant Molecular Biology Laboratory at USDA in Beltsville, Maryland. He served as a faculty member at Jawaharlal Nehru University for 23 years before becoming the group leader in Plant Molecular Biology at the International Centre for Genetic Engineering and Biotechnology in New Delhi, India. He has trained 29 PhD students and 25 postdoctoral researchers and served on editorial boards for 14 journals.

Early Career Award

The Early Career Award was instituted by the Society's executive committee in 2005 to recognize outstanding research by scientists at the beginning of their careers. This award is a monetary award made annually for exceptionally creative, independent contributions by a member of the Society who is not more than five years post-PhD on January 1st of the year of the presentation.

R. Keith Slotkin

Keith Slotkin, a new assistant professor at The Ohio State University, is recognized for his significant contributions in the field of



plant epigenetics and transposable element silencing. Keith entered the field of plant biology as an undergraduate at the University of Arizona, where he conducted undergraduate research with Vicki Chandler. He obtained his PhD in plant biology at the University of California at Berkeley, working on heritable transposon silencing with advisers Damon Lisch and Michael Freeling. In his postdoctoral work at Cold Spring Harbor Laboratory, under the mentorship of Robert Martienssen, Keith was exceptionally creative in performing experiments that combined epigenetics and gametophyte development in ways that had not been previously done. His research findings opened a new research topic, studying the epigenetic regulation of the pollen grain. In evaluating both single genes and taking genome-wide approaches, he has made outstanding research contributions that have produced publications in *Nature*, *Genetics*, *Cell*, *Nature Genetics*, and *The Plant Cell*. Keith has also excelled at teaching. He was named an Outstanding Graduate Student Instructor and received a Teaching Effectiveness Award at the University of California at Berkeley. As a postdoc, he co-taught genetics with a focus on plant genetics at both Cold Spring Harbor Laboratory and Queens College.

Excellence in Education Award

This award was initiated in 1988 to recognize outstanding teaching, mentoring, and/or educational outreach in plant biology. It is a monetary award to be made annually in recognition of excellence in teaching, leadership in curricular development, or authorship of effective teaching materials in the science of plant biology.

Jane Ellis

Jane Ellis has a long history as an outstanding plant science educator. Early in her career, Jane taught high school biology and chemistry. She was recognized with the South Carolina Science Teacher of the Year

Award before going on to earn her PhD in plant physiology at Clemson University. Over the past two decades, Jane has established herself as an outstanding teacher in college classrooms, teaching a broad array of undergraduate courses including plant physiology, medicinal plants, tropical biology, general biology, and others. Her reputation among high school teachers and college professors around the country is excellent, leading to her success in a variety of national leadership positions. She served on the ASPB Education Committee from 2005 to 2010, serving for two of those years as chair. Under her leadership, the committee expanded ASPB's presence at high-profile conferences such as the annual meetings of AAAS, NABT, and NSTA and made significant strides in offering more educational support for ASPB members. Jane has represented the plant biology community at a number of national meetings where the future of science education was being planned. With collaborators, she received a grant to generate and pilot inquiry-based activities to illustrate the 12 Principles of Plant Biology that will be publicly available for middle school and high school teachers around the country. Jane has also presented work related to plant science education at national and international conferences, authored numerous educational articles in the *ASPB News* and elsewhere, and been very active in training future science teachers. In summary, Jane Ellis has established herself as an outstanding educator and advocate for plant biology education.

Fellow of ASPB Award

Established in 2007, the Fellow of ASPB Award may be granted in recognition of distinguished and long-term contributions to plant biology and service to the Society by current members in areas that include research, education, mentoring, outreach, and professional and public service. Current members of ASPB who have contributed to

the Society for at least 10 years are eligible for nomination. Recipients of the Fellow of ASPB honor, which may be granted to no more than 0.2% of the current membership each year, receive a certificate of distinction and a lapel pin.

Julia Bailey-Serres

University of California, Riverside

Julia is a pioneer in the field of translational regulation and mRNA stability. Her work revealed the importance of polysomal mRNA and cell type specific mRNA expression during plant stress in response to flooding and low oxygen stress. Julia served ASPB as a member of the Program Committee from 2003 to 2006 and was a monitoring editor of *Plant Physiology* from 2002 to 2007. She is currently an associate editor of *Plant Physiology*.

Mark Brodl

Trinity University

Mark is a vibrant member of the Society who has pioneered innovative programs to bring undergraduate research to the forefront of ASPB and invigorate the Society membership. Most notable of these is the Summer Undergraduate Research Fellowship (SURF) awards program. In addition, Mark has served ASPB as treasurer and as a member of the Education Foundation (2000–2009), the Executive Committee (1998–2009), and the Excellence in Teaching Award Committee (1993–2002), which he chaired from 1996 to 2002. He also is recognized for research that investigates the effects of heat-induced changes in ER proteins and lipids on seed germination.

Alice Cheung

University of Massachusetts

Alice has made seminal advances in our understanding of sexual reproduction in flowering plants. In particular, she has used cellular, molecular, and biochemical approaches to define pollen–pistil interactions that result in growth and guidance of pollen tubes toward the ovule. Alice is a monitoring editor of *Plant Physiology* and

was a coeditor of a well-received focus issue on membrane trafficking published in 2008. Currently, she is the principal investigator and key coordinator of an NSF-funded Research Coordination Network grant on pollen biology, and she cochaired the symposium on pollen biology at Plant Biology 2010.

Gloria Coruzzi

New York University

Gloria is internationally recognized for her pioneering work in plant systems biology. She has identified networks regulating nitrogen use, in particular the structural and regulatory genes controlling asparagine biosynthesis. Furthermore, she identified gene networks regulating seed evolution through systems analysis of gymnosperm phylogenomics. Gloria's leadership was instrumental in producing a special issue of *Plant Physiology* in 2003 that was devoted to systems biology. Gloria also served as an associate editor for *Plant Physiology* from 2001 to 2005.

Elizabeth Hood

Arkansas State University

Beth's fundamental studies of cell walls and targeted gene expression in maize led to the development of methods to provide value-added products and a low-cost supply of enzymes for biomass conversion. Beth has served ASPB as an active member of the Women in Plant Biology Committee and was instrumental in initiating the career workshops for students and post-docs. She served as chair of the Women in Plant Biology Committee in 2001, as a member of the ASPB Executive Committee and Board of Trustees from 2002 to 2005, and as chair of the ASPB Board of Trustees in 2004–2005.

A.S.N. Reddy

Colorado State University

Reddy has made seminal contributions to our understanding of calcium signaling in plants as well as significant insights into mRNA splicing and plant responses to

pathogen attack. He is a dedicated educator and was recognized as the Outstanding Science Mentor in the Field of Biology at Colorado State University. He served on the ASPB Program Committee for three years and played a central role in organizing several successful annual meetings for the Society. In addition, he has served on the ASPB Executive Committee as the elected representative of the Western Section. He is a monitoring editor for *Plant Physiology*.

Stan Roux

University of Texas

Stan is recognized for his studies of plant signal transduction including his seminal studies of the role of calcium in phytochrome signaling and gravitropism. More recently, he has revealed a role for plant ecto-ATPases and annexins in calcium signaling and polar growth. He is well known for his enthusiasm for plant biology and for mentoring many young plant biologists. He served ASPB as a member of the editorial board of *Plant Physiology* from 1985 to 1992, as chair of the Publications Committee from 1992 to 1996, and as a member of the Executive Committee from 1992 to 1996.

Gary Stacey

University of Missouri

Gary is recognized for his research on nitrogen fixation, where he has identified factors produced by the bacterium and host that are essential for functional symbiosome formation and nitrogen fixation in soybean. His current work focuses on the development of tools to study soybean gene function. Gary has been a vocal advocate of plant biology and has served on the ASPB Public Affairs Committee since 2004. He has chaired the committee since 2006 and recently helped fill a critical gap left by the departure of the previous public affairs director. Gary also served as associate editor for *Plant Physiology* in 2005 and was the coeditor of the legume special issues in 2003 and 2005. He has also served on the ASPB Executive Committee.

David Stern

Boyce Thompson Institute for Plant Research at Cornell University

David is recognized for his seminal work on plastid RNA stability and nuclear–cytoplasmic interactions. Through his research, he identified chloroplast RNA binding proteins and ribonucleases directly involved in plastid RNA processing and chloroplast RNA stability during environmental stress. David served ASPB as a coeditor of *The Plant Cell* from 1994 to 2003. He also served on the ad hoc Publications Visions Subcommittee in 1998 and the ad hoc Strategic Planning Committee in 2005. He currently serves on the Charles Albert Shull Award Committee.

Elliot Meyerowitz

California Institute of Technology

Elliot's groundbreaking research in the 1980s originated the ABC model for the floral organ identity, which is used to this day to explain flower pattern development. His creative approaches to study cell-fate decisions and their regulation have influenced much of plant biology. Elliot is a vigorous public advocate for plant science and played a key role in organizing the community of scientists to sequence the Arabidopsis genome as a model system. In addition, Elliot, along with Chris Somerville, was a founding editor of ASPB's online free-access publication, *The Arabidopsis Book*.

Lawrence Bogorad Award for Excellence in Plant Biology Research

The ASPB Lawrence Bogorad Award for Excellence in Plant Biology Research was approved by the Society's executive committee in 2005 to honor Dr. Bogorad's many contributions to plant biology, including his influential efforts to bring the techniques of molecular biology to bear on problems in plant biology; his groundbreaking research on chloroplast genetics, biogenesis, structure, and function; and his inspired teaching and mentoring. The ASPB Lawrence Bogorad



Award for Excellence in Plant Biology Research is a monetary award made biennially to a plant scientist whose work both illuminates the present and suggests paths to enlighten the future. This award was awarded for the first time in 2006.

Nam-Hai Chua

Nam-Hai Chua has been a pioneer and leader in plant biology research and has contributed significantly to the development of fundamental tools essential to conducting molecular research in plants. Among his early innovations and discoveries are the characterization of chlorophyll protein complexes, the cloning and demonstration of nuclear genes encoding cytoplasmically synthesized chloroplast proteins, and the identification of plant *cis*-elements and transcription factors. The Chua laboratory pioneered the use of transgenic plants to study gene regulation controlled by light, hormones, stress, organ specificity, defense, and the circadian clock, paving the foundation for the current understanding of plant signal transduction pathways. Nam-Hai's current research continues to unravel key regulatory mechanisms in light and abscisic acid signaling and proteolysis and RNA-based controls. He has had a broad impact on advances in plant research through creation and sharing of powerful tools, including the strong constitutive promoter from the cauliflower mosaic virus, the glucocorticoid-mediated transcriptional induction system, the estrogen receptor-based transactivator, and Arabidopsis mutant screens based on luciferase imaging *in planta*. These tools have been widely used by both academic and industrial biotechnology researchers in the plant community worldwide. Nam-Hai has also served the community as a whole through his efforts editing numerous protocol books and by serving on editorial and advisory boards since the 1980s. His scientific contributions are truly international in nature, with significant

involvement not only in the United States but also in many countries in both Asia and Europe. Nam-Hai's most unique and unparalleled achievement is the transmission of his amazing energy and infectious excitement as a plant biologist to more than 130 young postdocs and students over the past 30 years, many of whom are now leaders in diverse fields in academic or industrial institutions around the globe. That is ultimately the highest contribution a scientist can make: to "enlighten the future."

Stephen Hales Prize

This award honors the Reverend Stephen Hales for his pioneering work in plant biology published in his 1727 book Vegetable Staticks. It is a monetary award established in 1927 for a scientist, whether or not a member of the Society, who has served the science of plant biology in some noteworthy manner. The award is made annually. The recipient of the award is invited to address the Society on a subject in plant biology at the next annual meeting.

Athanasios (Sakis) Theologis

Sakis Theologis is recognized for his sustained and outstanding contributions to plant science for more than 30 years. Until his recent retirement from active research, Sakis was an adjunct professor in the Department of Plant and Microbial Biology at the University of California at Berkeley and a research scientist at the USDA/ARS-UC Berkeley Plant Gene Expression Center. Sakis established a superb record of professional service, including being a founding instructor of the Cold Spring Harbor Laboratory Arabidopsis summer course and a key member of a small group of scientists who imagined, developed, and led the multinational Arabidopsis Genome Initiative (AGI). His enthusiasm for science is evident and pervasive, and he has been a truly inspiring mentor and colleague to many plant biologists.

During his career, Sakis made fundamental discoveries relating to the physiology of fruit ripening, the mechanism and regulation of ethylene synthesis and action, and the molecular basis of auxin action. For example, he was the first to isolate the gene for ACC synthase, which catalyzes the rate-determining step in ethylene biosynthesis, and he was the first to clearly show that auxin rapidly stimulates transcription of specific genes. Those in the field acknowledge that Sakis's early work laid the foundation for our current detailed knowledge of auxin signaling. During the last part of his career, he was a pioneer in the effort to move plants into the genomics age. In 2000, the sequence of Arabidopsis chromosome 1 was published in *Nature* in the same issue as the complete genome sequence. The chromosome 1 paper had multiple authors, of course, but Sakis was both the senior and corresponding author of this landmark paper.

In short, Sakis effectively integrated the qualities of research scientist, educator/mentor, and leader in the field of modern plant hormone biology and genomics, and in so doing he served the science of plant biology in a most noteworthy manner. 🌿

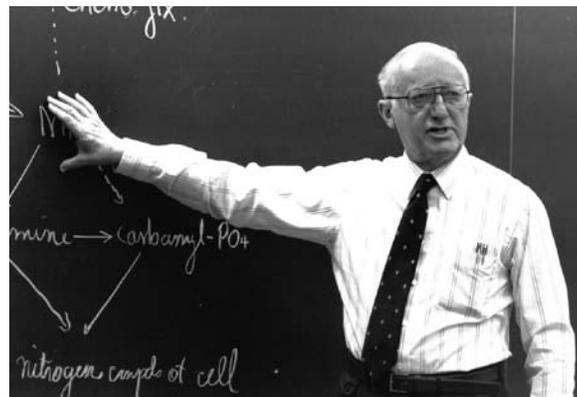
The Eric E. Conn Young Investigator Award

Recognizing Outstanding Research by Plant Scientists at the Beginning of Their Careers

ASPB is pleased to announce the Eric E. Conn Young Investigator Award, a new award that will recognize not only outstanding research, but also a demonstrated commitment to outreach, public service, mentoring, or teaching by a plant scientist no more than five years post-PhD. The award will be offered for the first time in 2011 and on a biennial basis thereafter.

The Eric E. Conn Young Investigator Award was approved by the Society's Executive Committee to honor Eric Conn's many contributions to plant biology. Eric is best known for his research on cyanogenic glycosides in plants, by which he and colleagues described novel structures, biosynthetic mechanisms, and distributions in the plant kingdom. The latter work aided in refining the taxonomy of acacias and eucalypts, and in recognition of these contributions, the acacia *A. conniana* was named for him. Eric has energetically propagated his knowledge by coauthoring with Paul Stumpf the classic biochemistry textbook

Outlines of Biochemistry, which has been translated into six languages, and by editing the 16-volume *Biochemistry of Plants: A Comprehensive Treatise*, a foundation for many of the recent advances in plant biochemistry. In recognition of his excellence in teaching, Eric was awarded the University of California, Davis, Prize for Teaching and Scholarly Achievement. Graduate students, postdoctoral fellows, and visiting scientists who worked with him over a period of more than 40 years at the University of Chicago, UC Berkeley, and UC Davis were mentored by example and direct support, both in and out of the lab, into productive careers of their own. His active role in the field of plant biology led him to become president of this Society in 1986–1987. For his many contributions, he was elected to the National Academy of Sciences in 1988.



Eric E. Conn

This award honors Eric's contributions in plant biology by recognizing young scientists who will be inspired to follow in his footsteps. The inaugural Eric E. Conn Award will be given at the next Plant Biology meeting in Minneapolis, Minnesota, on August 6, 2011. Information about nominating a candidate for this award will be posted on the ASPB website early next year, and nominations for this and all other 2011 awards will be accepted until March 1, 2011.

ASPB Debuts New Website

This issue of the newsletter contains information on two initiatives that I discussed one year ago in my final president's letter: enhancing ASPB connections and opportunities with NIH (see article on page 32 of this issue) and overhaul of our Society's website.

By now many of you have probably already visited the new website: <http://aspb.org>; if you haven't, I encourage you to do so. Just to recap, the website overhaul process started two years ago, with a survey sent out first to the Executive Committee of ASPB and then to all ASPB members, asking for suggestions on design and content of a new website. After receiving over 200 responses to the survey, an ad hoc website overhaul committee was

formed, which has been very active in creating audience and content guidelines in addition to providing suggestions and feedback throughout the overhaul process. I'd like to thank and congratulate the committee members on what has been achieved through their help:

Tyrell Carr
University of North Carolina, Chapel Hill

Charles Chen
Japan International Research Center for Agricultural Studies

Frank Dohleman
Monsanto Company

Kateri Duncan
Syngenta Biotechnology

Matt Escobar
California State University, San Marcos

Rodrigo A. Gutierrez
Pontificia Universidad Catolica de Chile

Rob Last
Michigan State University

Jen Moon
University of Texas at Austin

Angus Murphy
Purdue University

Anneke Prins
University of Exeter

Ian Street
Dartmouth College

continued on page 26

New Website
continued from page 25

Sarah Swanson

University of Wisconsin

Michelle Xicotencatl-Lozano

Escuela de Biología, BUAP Mexico

The actual website revision was done by Wendy Sahli, ASPB's manager of marketing and web services. Although the basic website platform was purchased from yourmembership.com, Wendy had to do a great deal of custom programming to integrate the site with the extant ASPB membership database and custom applications, such as the Diversity Bank and grant application forms. ASPB's membership, meetings, and marketing specialist, Shoshana Kronfeld, also played a part in integrating membership forms and content. In addition, Wendy and Jean Rosenberg, director of meetings, marketing, and membership, worked with a professional design firm, Sharp & Co., as well as with the website overhaul committee to create a modern and engaging "look and feel" for the new website and to ensure

that the style of the site is consistent with other materials produced by ASPB. Finally, much valuable feedback on a draft version of the website was received from attendees at ASPB's annual meeting in Montréal. Thanks to those of you who participated in that process—you will find that many of your suggestions have been incorporated into the final design of the website.

While the new site contains all of the information included at the old website, it also has many additional features. In particular, the new website accommodates many different types of social networking. From the "Online Community" link on the toolbar, website users can choose to participate in several online communities, including a community for all ASPB members, communities for each of the ASPB sections, and user groups created by groups of individuals who share common interests in plant biology—a format analogous to Google groups. Thus, each user can create and manage his or her own customized web presence. In addition, on the new website, information is parsed both by content, as was

done in the past, and also by audience. Serving up content by audience should facilitate use of our website by nonscientists such as K–12 educators and the general public. The entire front end of the website and all static pages are ADA compliant, which also ensures that the site is accessible to anyone with slower network connectivity. Included with the new website is an ASPB iPhone app that gives members access to their profile, groups, and member directory. Search for "ASPB" in the app store to access the free download.

One last comment is that you no longer need to remember your ASPB membership number to enter the members-only areas of the website. This was the #1 request from the web survey—you asked and we listened! Although the new website has now debuted, it is still possible to provide feedback and suggestions. Simply send an e-mail with your comments to wendys@aspb.org.

Sally Assmann
Immediate Past-president, ASPB

Wendy Sahli
Manager of Marketing and
Web Services, ASPB

Why compromise when you don't have to?

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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: Han Xiao

Title: PhD, Principal Investigator

Place of Work or School: Shanghai Institutes for Biological Sciences, Chinese Academy of Sciences

Research Area: Plant Development

Member Since: 2005

1. Has being a member of ASPB helped you in your career? If so, how?

I have attended many excellent meetings hosted by ASPB, which provided great opportunities for exchanging scientific ideas and networking. ASPB also provides useful information online that helps me stay up-to-date with ongoing plant research activities.

2. Why has being a member of ASPB been important to you?

Many times I feel ASPB is my “home town,” where I can find lots of things I need, from great networking with plant biologists around the world to current plant research work.

3. Was someone instrumental in getting you to join ASPB?

Esther van der Knaap, my postdoc adviser at the Ohio State University.

4. What would you tell nonmembers to encourage them to join?

It is important to join active scientific societies if you want to become an active researcher. ASPB is the right society for plant biologists around the world.

5. Have you found a job or hired anyone using ASPB job postings or networking at the annual meeting?

When I decided to do a postdoc outside my home country, ASPB’s website was the first place I looked. I also will use this great feature to recruit talented people to join our research program.

6. Do you still read print journals? If so, where do you usually read them: work, home, library, in the car, on the bus, or somewhere else?

In the electronic era, it is far more convenient to read papers online. Occasionally, I read printed journals at home or in my office.

7. Have there been any issues in plant biology in which you thought ASPB should be involved or that led you to consider becoming active in the governance of the Society?

ASPB could be more involved in issues such as global warming and biofuel and their impact on food security.

8. What do you see as the most important role for scientific societies such as ASPB?

Scientific societies can provide many services to meet our demand for scientific knowledge. The most important one would be providing a platform with rich resources that is freely accessible to everyone around the world, just like APSB is providing a variety of resources for education and teaching.

9. What could ASPB do better?

ASPB could provide more resources to plant researchers in developing countries.

10. What advice would you give to a plant scientist just starting out?

Let your enthusiasm be the driving force behind your research work.

11. What do you think is the most important discovery in plant biology over the past year and why?

The greatest discovery in 2009, I would think, is the breakthrough in identification of ABA receptors. ABA receptors have attracted much attention in the field because of the hormone’s importance in agriculture. In the past year, several papers described the identification of ABA receptors and their crystal structures with bound ABA. Those studies revealed the complicated nature of plant development and response to environments by phytohormone ABA.

12. What do you think is the next “big thing” in plant biology?

The next “big thing” in plant biology I would expect is lab bench tools for integrating the massive information generated from various omics studies and then providing testable models/networks.

13. What do you still have left to learn?

As the Chinese proverb says, “You are never too old to learn.” There are lots of fascinating things about plants I want to know. 

You have the gene... now what can it do?



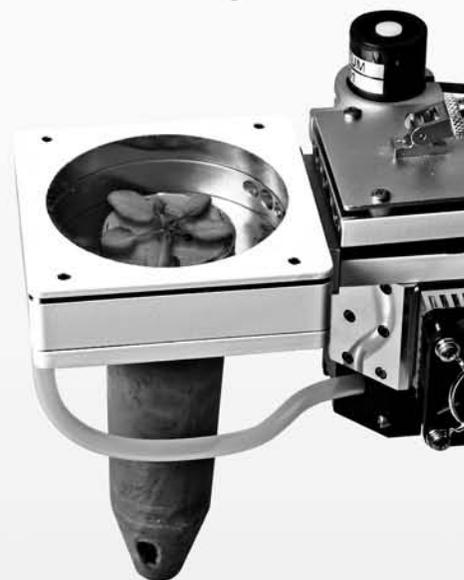
Now you can easily add physiology measurements to your assay tool kit.

You know the reasons that make *Arabidopsis thaliana* an excellent model for gene expression studies (short generation time, small, sequenced genome, mutant collection, ease of cultivation, etc.). It is essential to add physiological assessment of in situ function to validate regulatory or functional genes identified by genomic, molecular or bioinformatics results. Regulation or loss/gain of function effects on photosynthetic and/or respiratory pathways can be measured through gas exchange with the LI-6400XT Portable Photosynthesis System and the new 6400-17 Whole Plant Arabidopsis Chamber. Gas exchange measurements are rapid, non-destructive and repeatable over the life span of the plant.

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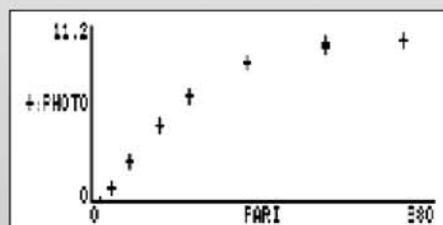
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Light Curve
Desired lamp settings (μmol/m2/s)
600 800 600 400 250 175 100 50 25 15 8 0
Minimum wait time (secs) 120
Maximum wait time (secs) 200
Match if |ΔCO2| less than (ppm) 20 _
De|Ln +ClrEnd +De|Char+CapLock+On|yChar
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Conversation with NIFA about AFRI RFAs

This past spring, ASPB President Tuan-hua David Ho wrote to Roger Beachy, director of the National Institute of Food and Agriculture (NIFA), expressing the Society’s overall support for NIFA’s Agriculture and Food Research Initiative (AFRI) while also conveying the concerns of ASPB members with some aspects of AFRI’s fiscal year 2010 Requests for Applications (RFAs). In particular, these concerns include the small amount of funding for foundational research, the narrow focus of the six priority areas within the AFRI RFAs, and the

availability of AFRI program staff to manage Coordinated Agricultural Projects (CAP), which may be quite large and involve many collaborators.

Beachy has offered a response to ASPB’s letter that thanks the Society for its thoughtful comments and underscores NIFA’s intention to increase support for discipline-based research through its Foundational Programs from 25% of AFRI funding to 30%; moreover, the amount of available funding would increase proportionately with the growth of the AFRI budget as a whole. He also

mentioned that NIFA would explore ways to modify the Foundational Programs to “allow submission of more innovative investigator-initiated work whose outcome may serve the future of U.S. agriculture” and will identify and develop best practices for management of the CAP grants.

The FY2011 AFRI RFAs are expected to be released before the end of calendar year 2010.

The letters to and from Beachy are below, including notes to provide additional context.



American Society of Plant Biologists

April 27, 2010

Dr. Roger Beachy
Director
National Institute of Food and Agriculture
United States Department of Agriculture
Jamie L. Whitten Federal Building; Room 305-A
1400 Independence Avenue, S.W., Washington, D.C. 20250

Dear Dr. Beachy:

I am writing on behalf of the American Society of Plant Biologists (ASPB) and its membership, which—as you well know—includes a preponderance of scientists whose research interests tend toward fundamental discovery but also many researchers whose work collectively spans the continuum from fundamental plant science to its applications in the field. Due to the interest of our membership, ASPB has been an ardent and long-term supporter of competitive research funding by the United States Department of Agriculture, as well as by other agencies. We recognize and support the notion that, to conform to the Department’s overall mission, USDA-funded research must span the bench-to-field continuum.

Furthermore, ASPB endorses the recent restructuring of the USDA’s research portfolio and the progressive and ambitious stances that are emerging as a result. Our membership is very supportive of the recent increases in funding for AFRI competitive research programs, and we are especially encouraged by the efforts of this administration to significantly increase future funding.¹ We understand the practical and political needs to see clear outputs deriving from the Department’s research funding portfolio, as well as the establishment of more programs that are jointly conceived and run by the USDA and other federal science agencies. We also support efforts to provide rigorous peer review to both the extramural and intramural programs at USDA to ensure their relevance and continued future success.²

However, since the release of the highly anticipated RFA under the new AFRI research structure,³ I and others in the ASPB leadership have been fielding many messages of concern from ASPB members in the university and ARS communities, although there is also much to be excited about.

Among these very positive elements, we fully endorse the focus on the goals outlined in the NRC “New Biology” report that are strongly highlighted in the RFA.⁴ Indeed, we have conveyed our strong support for this report during our meetings in Washington, in part due to the fact that this report envisions many areas in which plant biology research will enable progress toward solving the grand challenges it lays out.

The (pending) seventh component of the RFA also promises increased fellowship support for graduate students and postdoctoral fellows, which is so important to ensure the future health of the plant and agricultural research endeavor by selecting and encouraging the brightest students to pursue agriculturally relevant studies.⁵

continued on page 30

ASPB to Roger Beachy
continued from page 29

We note that the RFA strongly endorses the coordinated agricultural project (CAP) model that had been used successfully in the past for crop-centric projects. The idea of a fully integrated effort to tackle problems of critical national importance is compelling. However, in our view, not all of the past CAP projects were highly successful, and some suffered from issues of effective management and a lack of sufficient funds to provide critical mass once divided across so many participants. It is clear that the success of these CAP grants will require active participation of current AFRI program staff to gauge progress, to address problems that might arise, and to ensure that goals are being met. One of our major concerns is that the already over-worked AFRI program staff will be unable to provide sufficient oversight given the large increase in the number and scope of CAP awards reflected in the current RFA. We note that this issue does not seem to have been addressed in the RFA or any of the recent public statements made by NIFA personnel.

As I indicated, our membership has conveyed a number of other issues, as well as questions, that we would like to bring to your attention. Our intent is to share these with you in the spirit of cooperation and with a view toward influencing your thinking as planning for the next RFA begins in due course.

First, there is significant unease about the small amount of funding available for foundational research programs.⁶ We understand that NIFA's intent is to grow this program in future years and we expect that to happen. However, there is some concern regarding the prospects for significant increases in future funding given the current fiscal climate.⁷ Yet basic research is the intellectual engine that drives the more applied outcomes that are so important to the USDA mission. As such, ASPB feels at the same time USDA expands programs for large-scale, integrated bench-to-field projects, it is vital for AFRI to maintain a broad, stable research enterprise. Although we often hear calls for greater support of "innovative" and "impactful" research, clearly paradigm-shifting discoveries cannot be predicted or engineered. Hence, the only way to ensure that such discoveries occur is to continue to provide robust and growing support for foundational research by individual investigators.

The AFRI RFA released March 21 offers very specific guidance organized around the six priority areas identified by Secretary Vilsack. No doubt the purpose of this specific language was to provide guidance to avoid confusion over the goals of these new programs and to ensure that submitted proposals were relevant and complete. However, an unintended outcome is that the guidance is focused so narrowly that it seems to preclude a large number of fundamental scientists from submitting proposals. This narrow focus also tends to limit the kind of creative and innovative research described above that frequently leads to novel findings and unanticipated connections and advances. This is of particular concern regarding more junior investigators. Indeed, the cynical view is that the RFAs are written so narrowly that only a few institutions are targeted for support. Although we fully understand that this is not the intent, leaving this false impression in the community undermines support for the larger, progressive goals of NIFA.

Although we appreciate the effort made by you and the department to explain the bigger picture in which the 2010 AFRI RFA should be placed during your webcast on March 22,⁸ we would appreciate seeing similar outreach efforts throughout this process. Indeed, ASPB stands ready to help in that endeavor and, at a minimum, we'd be delighted to publish both this letter and your response to it—in addition (of course) to the support work we have been doing for the NIFA/AFRI Stakeholders' Workshop that was held in Washington, D.C., on April 13.⁹

To conclude, we believe that NIFA funding should accomplish at least two goals. To be sure, it should seek solutions to the pressing issues outlined in the six priority areas, a goal that is well addressed in the current RFA. However, a second and larger goal should be to maintain a robust and sustainable U.S. agricultural research enterprise, one that is both poised and adequately resourced to address future challenges. In our view, the narrow focus of the current RFA and its emphasis on large, multi-institution projects does not provide the basis for addressing this second goal.

We hope that AFRI will structure its review panels for proposals that are submitted this year in a manner that can address these concerns. We hope, too, that Congress will see fit to grant President Obama's request for AFRI in the FY2011 budget, and we will continue to work diligently in support of that objective—and also to offer whatever assistance you may wish in the event that FY2011 budgetary exigencies oblige you to revise your plans for AFRI's next major RFA.

Finally, we recognize that AFRI and NIFA face a lot of challenges in getting up and running. Meeting these challenges illustrates how much more money is needed for research, and we hope the administration continues to view AFRI as a worthy endeavor and requests significant funding increases bringing the program to the authorized level of \$700 million in due course.

Sincerely,



Tuan-hua David Ho

President, ASPB

Washington University in St. Louis

Notes

1. The Obama Administration proposed a 64% increase for AFRI funding in the president's FY2011 budget over the 2010 budget. However, Congress is likely to appropriate a budget with a much smaller increase, likely closer to 15-20%.
2. See http://www.nifa.usda.gov/business/competitive_peer_review.html for more information about NIFA peer review for competitive grant applications.
3. See http://www.nifa.usda.gov/funding/rfas/afri_rfa.html for the seven AFRI requests for applications (RFAs).
4. See <http://dels.nas.edu/Report/Biology-21st/12764> for more information about the National Research Council's 2009 report *A New Biology for the 21st Century*.
5. The RFA for predoctoral/postdoctoral Fellowship Grants was released in June 2010. See http://www.aspb.org/publicaffairs/research/USDANIFA_2010Fellowship.CFM for additional information.
6. NIFA planned to devote \$64 million to the Foundational Program within AFRI in FY2010 out of a total of \$262 million for AFRI.
7. See note 1 above; Congressional appropriations may be far below that proposed by the president.
8. An archived version of the webcast is at <http://www.nifa.usda.gov/newsroom/webcast.html>.
9. See <http://www.aspb.org/publicaffairs/stakeholders/> for information about the Stakeholders' Workshops on Plant and Pest Biology, which ASPB has coordinated since 2002.



United States Department of Agriculture

Research, Education, and Economics

National Institute of Food and Agriculture

1400 Independence Avenue SW Washington, DC 20250

Dr. Tuan-hua David Ho, President
American Society of Plant Biologists
15501 Monona Drive
Rockville, MD 20855-2768

Dear Dr. Ho: *David*

Thank you for your letter dated April 27, 2010, regarding the Agriculture and Food Research Initiative (AFRI) program, which is administered by the National Institute of Food and Agriculture (NIFA). We value your interest in AFRI and appreciate your thoughtful comments. The suggestions in your letter, as well as those provided by other stakeholders, will be carefully considered before we begin developing the fiscal year 2011 AFRI requests for applications (RFAs). Stakeholder comments received to date are posted on the <http://www.regulations.gov> website and can be accessed under Docket #NIFA-2010-0001.

As you know, the AFRI program has been restructured to be more responsive to important national issues, such as those identified in the FY2010 challenge area RFAs. Despite the focus of the RFAs on the challenge areas, it continues to support single-investigator and/or small-team projects. In FY2010, about 25% of AFRI funding will be used to support discipline-based research through its Foundational Programs. These programs support work that helps to build the foundation of knowledge needed to solve both current and future problems, offering grants of \$500,000 to \$750,000 in total. It is our intent to increase support of Foundational Programs to 30% of AFRI funding in future years, allowing for a greater investment in discipline-based work over time. As the budget for AFRI grows, the amount of funding available for these programs will increase proportionately. Your concerns about the somewhat narrow focus of the Foundational Programs were communicated by other stakeholders as well. NIFA will explore ways to modify the Foundational Programs in the future to allow submission of more innovative, investigator-initiated work whose outcome may serve the future of U.S. agriculture.

We acknowledge the challenges inherent in reviewing and managing grants of the size offered by the AFRI program this year. Members of the AFRI program staff are consulting broadly, both within and outside NIFA, to identify and develop best practices for effective management of these programs. We are excited about the significant outcomes that are expected by these grants and feel confident that the NIFA program staff has the experience and creativity needed to address program management challenges as they arise.

Thank you, again, for your support of the AFRI program and for taking the time to comment on the FY2010 RFAs. We will give your suggestions full consideration as we move forward. We expect to release the FY2011 AFRI RFAs before the end of the calendar year.

Sincerely,
Roger N. Beachy
Roger N. Beachy
Director

NIH 101 at Plant Biology 2010

The National Institutes of Health (NIH), the nation's largest life sciences funding agency, is taking an increasing interest in plant biology. For the first time, NIH sponsored a booth at the Plant Biology meeting, joining its U.S. federal colleagues from the Department of Agriculture, Department of Energy, and National Science Foundation. Two NIH representatives offered a vibrant and interactive workshop, NIH 101, to help participants understand the NIH, navigate its funding programs, and prepare applications that will be competitive for funding.

NIH has an annual budget of more than \$31 billion, most of which goes to support extramural scientific, medical, and behavioral research at universities, hospitals, and research centers across the country and around the world. In fact, unlike many other federal agencies, NIH research grants are generally not limited to U.S. citizens or those working within the United States.

NIH funding opportunity announcements may be either Requests for Applications (RFAs), which are meant to spur research in a defined area and have a set-aside budget, or Program Announcements (PAs), which support broad categories of research and are submitted on a regular cycle with no special set-aside budget. Applications submitted under either of these mechanisms are generally managed by the Center for Scientific Review (CSR), which oversees NIH's peer review process; CSR and its scientific review officers (SROs) are separate from the NIH institutes and centers (ICs) that actually provide funding for grants and that are where program directors are located.

Upon receipt of an application, CSR assigns it to a particular study section for peer review and determines which IC will receive the application after it has been reviewed. Decisions of what to fund are made by the

individual IC, with the final funding decision made by its director—informed by specific guidance from the IC's external advisory committee—on the basis of scientific merit, programmatic considerations, and the availability of funding.

At the NIH 101 session in Montréal, CSR Deputy Director Cheryl Kitt emphasized that NIH is looking for impact, i.e., a sus-

tained, powerful influence on the field. Although new core review criteria also consider significance, investigator, innovation, approach, and environment, it is the overall impact/priority score that determines the rank order of the proposal.

NIH has recently made changes to the peer-review process by restructuring the application, especially by decreasing its length (e.g., the research strategy section is now limited to 12 pages for most proposals, down from 25), enhancing the review criteria, changing the scoring system, and implementing structured critiques. NIH is also giving special consideration to researchers designated as Early Stage Investigators (ESIs), defined as those who have not competed successfully for an NIH research grant and are within 10 years of completing a terminal research degree; those identified as ESIs will receive a greater likelihood of funding for R01 applications, NIH's main research grant mechanism, and new investigators are reviewed separately from more established investigators.

R01 research project grants are NIH's primary funding mechanism for investigator-initiated research. They are awarded for up to five years with up to \$500,000 per year in direct costs; in addition, they generally may be renewed by competing for an additional project period. R15 grants, which support small research projects at institutions that have not been major recipients of NIH re-

"There is no amount of grantsmanship that will turn a bad idea into a good one...but there are many ways to disguise a good idea."

— Dr. William Raub
Past Deputy Director, NIH



Cheryl Kitt

search grants, are also available to researchers at selected institutions; they are meant to not only support meritorious research, but to strengthen the institution's research infrastructure and expose students to research.

Study section members and ad hoc reviewers are drawn from the scientific community from among those who have a track record of publications and extramural funding, but it is not required that this funding be from NIH. Unlike many other agencies, the composition of NIH study sections is made public, and grantees can request a list of study section members 30 days in advance of the study section meeting or find this information on the CSR website. Priority scores are made available to applicants one to two days after the study section meets, with summary statements available within 30 days (10 days for ESIs and other new investigators).

Michael Bender, program director with NIH's National Institute of General Medical Sciences (NIGMS), emphasized that his institute is interested in fundamental knowledge that may subsequently contribute to understanding of disease. He suggested that prospective grantees make the case for how the proposed research contributes to knowledge relevant for health rather than making too great a stretch to a specific disease. NIGMS, which alone had a budget of more than \$2 billion in the 2010 fiscal year, supports a large number of foundational research grants and devotes approximately 10% of its budget to research training.

Kitt and Bender offered several pieces of advice to prospective NIH grantees within the ASPB community:

- Focus on impact; that is, how the proposed research will exert a sustained, powerful influence on the field.
- Emphasize how your research will contribute to health—but don't oversell the application of your research to a particular disease if not warranted. NIGMS, in particular, supports fundamental research with a more general relevance to health.
- Include a cover letter with your application, in which you can request a specific study section to review your proposal and suggest an IC that may be appropriate to fund your grant. For multidisciplinary proposals, you can also identify the disciplines involved to help CSR in identifying reviewers.
- Include a personal statement with your biosketch describing your ability to conduct the research; this is especially helpful for those moving into new fields.
- Review the missions of particular ICs to help in targeting your application to the most appropriate IC.
- Contact the relevant program director within the IC and the SRO within CSR for advice about specific programs, study sections, and the review process. These NIH staff are there to help you manage the application and award process.
- Early Stage Investigators are encouraged to apply for R01 awards, as opposed to R21s and other mechanisms, since ESIs receive extra consideration for R01s and, thus, a greater chance of funding.
- Sign up for the weekly *NIH Guide for Grants and Contracts* e-mail alert from the Office of Extramural Research, which contains official notification of NIH policies and includes all funding announcements.
- Consult past NIH awards by searching NIH's new RePORTER tool to see what NIH has funded in the past.
- Ask colleagues who have received NIH



Michael Bender

funding if they will share their proposals with you.

- Consider volunteering to serve as a reviewer to see the process from the inside. If you wish, ASPB will be happy to submit your name to CSR; just indicate your interest by e-mail to afagen@aspb.org.

Kitt and Bender have also agreed to make their presentations, including some additional slides, available to all ASPB members. Please visit <http://aspb.org/researchfunding/> for more information.

NIH websites that you may find helpful:

- NIH home page: <http://www.nih.gov/>
- NIH institutes and centers: <http://www.nih.gov/icd/>
- Center for Scientific Review: <http://www.csr.nih.gov/>
- Office of Extramural Research: <http://grants.nih.gov/>
- NIH RePORTER: <http://projectreporter.nih.gov/>
- NIH grantwriting tips: http://grants.nih.gov/grants/grant_tips.htm
- NIGMS: <http://www.nigms.nih.gov/>

ASPB will continue to build connections with NIH. We welcome your thoughts and suggestions on ways that we can help foster this relationship and similar interactions with other funding agencies. Please send any comments to ASPB's Public Affairs Director, Adam Fagen, at afagen@aspb.org. 

Adam P. Fagen, PhD
Public Affairs Director, ASPB

The NIH 101 session in Montréal is one outcome of a sustained effort, led by ASPB Immediate Past President Sarah M. (Sally) Assmann (Penn State University), to build connections between ASPB and NIH.

The initiative has emphasized that ASPB members are engaged in a wide diversity of fundamental and applied plant biology research, much of which has applicability for human health, including nutrition, drug discovery, and contributions to fundamental knowledge of biological systems.

For example, this past June, Sally gave a well-received presentation to NIH's Nutrition Coordinating Committee. Among the achievements Sally highlighted in her presentation were the BioCassava Plus program, a scientific collaboration between U.S. and African scientists to address malnutrition in sub-Saharan Africa, which has been led by the Danforth Center's Richard Sayre; research on plant metabolomics to identify new pharmaceuticals, similar to the way the plant-derived taxol has played a major role in treating several types of cancer; extracellular trapping of pathogens, from the work of Martha Hawes (University of Arizona); and the many fundamental discoveries that were first made in plants, including transposons (Barbara McClintock) and RNAi (Richard Jorgensen and David Baulcombe).

Sally has also held a series of meetings with NIH officials, including representatives of the Center for Scientific Review, National Institute of General Medical Sciences, National Cancer Institute, National Center for Complementary and Alternative Medicine, and the Office of Dietary Supplements within the Office of the Director. At press time, several additional meetings were planned with other institutes.

Nina Fedoroff Receives Leadership in Science Public Service Award

Long-time ASPB member Nina V. Fedoroff received ASPB's 2010 Leadership in Science Public Service Award at the Plant Biology 2010 meeting in Montréal. Following in the footsteps of such past recipients as Senator Kit Bond, Golden Rice developer Ingo Potrykus, Nobel laureate Norman Borlaug, former assistant director for biological sciences at the National Science Foundation (NSF) Mary Clutter, and former Washington University chancellor and Donald Danforth Plant Science Center chairman Bill Danforth, this award recognizes outstanding contributions to science and society.

Nina was named science and technology adviser at the U.S. Department of State by then Secretary of State Condoleezza Rice in August 2007. The following month, Henrietta Fore, administrator of the U.S. Agency for International Development (USAID), invited Nina to serve in the same capacity for USAID. In these roles, she served as the State Department's chief scientist and principal liaison with the national and international scientific and engineering communities. During her tenure, she worked to enhance science and technology literacy and capacity at the State Department and provide advice on current and emerging science and technology issues as they affected foreign policy. Ironically, Nina concluded her service at the State Department on July 31, the day she received her award, but she remains active in advancing conversations at the intersection of science and society.

Nina has conducted fundamental research in the molecular biology of plant genes and transposable elements, as well as on the mechanisms plants use to adapt to stressful environments. Her achievements began early in her career, determining the nucleotide sequence of the first complete genome while still a postdoc. She then went on to isolate and characterize maize transposons, building on the pioneering

genetic studies of Barbara McClintock. In subsequent years, Fedoroff's lab showed that maize transposons were active in a variety of other plants, developed transposon tagging systems, and studied the epigenetic regulation of transposon activity. Her current research is directed at understanding the genetic organization and molecular dynamics of plant stress and hormone response and makes use of DNA microarray expression profiling, reverse genetics, and theoretical approaches to the analysis of large datasets.

Nina graduated summa cum laude from Syracuse University with a dual major in biology and chemistry and earned her PhD in molecular biology from the Rockefeller University in 1972, conducting research on RNA bacteriophage. She then went on to serve postdoctoral, staff, and faculty positions at the University of California, Los Angeles; the Carnegie Institution of Washington; and Johns Hopkins University before moving to Pennsylvania State University in 1995. At Penn State, she is the Willamen Professor of Life Sciences and Evan Pugh Professor in the Biology Department and the Huck Institutes of the Life Sciences. She is also a member of the External Faculty at the Santa Fe Institute. She previously served as director of Penn State's Biotechnology Institute and was founding director of the Life Sciences Consortium, now the Huck Institute, which brought together life scientists from across seven colleges at the university for multidisciplinary research and teaching.

Long aware of the impact of science on society, in 2004 Nina authored *Mendel in the Kitchen: A Scientist's View of Genetically Modified Foods*, a book that examines the scientific and societal issues surrounding the introduction of genetically modified crops. Nina has served science in many other capacities as well. In addition to her State Department role, she has been a member of



ASPB's public affairs committee chair Gary Stacey and Nina Fedoroff.

the National Science Board, which governs the NSF, and the Council of the National Academy of Sciences, and has served on the boards of the International Science Foundation, AAAS, Genetics Society of America, BIOSIS, International Scientific Advisory Board of the Englehardt Institute of Molecular Biology in Moscow, and the Sigma-Aldrich Chemical Company. She also was recently elected to serve as the 2011 president of AAAS.

Nina is a member of the National Academy of Sciences, the American Academy of Arts and Sciences, the European Academy of Sciences, and the American Academy of Microbiology. Among her other awards and honors is Sigma Xi's 1997 McGovern Science and Society Medal, the New York Academy of Sciences' 1992 Outstanding Contemporary Woman Scientist Award, University of Chicago's 1990 Howard Taylor Ricketts Award, and Syracuse University's 2003 Arents Pioneer Medal. In 2006, she was named a National Medal of Science laureate, the nation's highest award for scientific achievement.

ASPB's Public Affairs Committee bestows the ASPB Leadership in Science Public Service Award. The committee welcomes nominations for future awardees, which may be sent to ASPB's public affairs director, Adam Fagen, at afagen@aspb.org.

Adam P. Fagen, PhD
Public Affairs Director, ASPB



Education Booth Brings Plant Biology Principles and Hot Topics Discussions to Montréal

The ASPB Education Booth at Plant Biology 2010 in Montréal featured a dynamic array of education and outreach resources for the plant biology community. Sponsored by the ASPB Education Committee and Education Foundation and coordinated by Education Committee member Chad Jordan (North Carolina State University), the booth was a popular gathering place in the main exhibit hall to discuss educational ideas, efforts, and activities for all learning levels.

12 Labs

A highlight of this year's booth was an exhibit on inquiry-based labs for the 12 Plant Biology Principles. Education Foundation Grant Awards Program (GAP) recipients Jeffrey Coker (Elon University), Jane Ellis (Presbyterian College), and Mary Williams (ASPB) shared their research-based efforts to develop hands-on activities that can be used to teach students about each of the 12 Principles of Plant Biology. Materials for four of the labs were on site for visitors to interact with, including those on plant defenses (Mean and Green), plant uses (A Rainbow of Uses), and plant evolution (Seeds of Change). Jeffrey, Jane, and Mary handed out numerous CDs with the complete lab descriptions and protocols, including teachers' guides, and explained how the labs could be scaled up or down for use at different grade levels. The 12 Labs are now openly accessible on the ASPB website at <http://aspb.org/education/12Labs/>.

Hot Topics

With sponsorship from the Fralin Life Science Institute at Virginia Tech, the Education Committee initiated a new format for discussing education-related issues at the annual meeting: hot topics discussions. Individuals who wanted to share or get feedback on their education-related work in a



(above) Larry Griffing discusses teaching resources with a booth visitor.

(top right) 12 Labs co-PIs Jeffrey Coker (left) and Jane Ellis (center) discuss inquiry-based teaching methods with an ASPB member.

(right) ASPB Education Booth provides interesting perspectives on science education and outreach.



highly interactive fashion—or find collaborators—led these informal sessions. For example, Jane Ellis led an interesting discussion on teaching plant physiology labs with the aim of finding ways to “modernize” her curriculum. Eight conferees participated in this discussion, which included sharing participants' current approaches to teaching their plant physiology labs. The discussion then moved to participants' learning goals and their interests for changing what they were teaching. Conferees brainstormed a list of ideas on how to make better use of technology, from using timelapse video, to studying plant growth and development, to using polymerase chain reaction of conserved regions of plant genomes to investigate evolutionary relationships. Conferees also made suggestions about how to tie what they were teaching to local and regional issues—for example, by tasking students with collecting local plant samples and identifying their evolutionary relationships or antimicrobial properties.

Penny Humby and Stacie Reck (Crandall University), winners of this year's ASPB

Education Booth Competition, led two discussions on strategies for active learning in undergraduate classes. They highlighted ways to characterize learning styles and to ensure that teaching strategies are sufficiently diverse to reach students who learn better by doing, observing, analyzing, and so on.

The session by Penny and Stacie nicely complemented another by Wendy Silk (University of California, Davis), who demonstrated how she used music to teach science. Students in her environmental science class, who typically worked in groups that included science majors and nonmajors, were expected to write and perform songs to illustrate particular environmental science concepts. Wendy was especially pleased that this gave her students a different and very positive way to think about science and that this was reflected in her teaching evaluations. Excitingly, these discussions continued in an even less formal way as conferees thought more about one another's interests and made suggestions as

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Education Booth continued from page 35

they ran into one another in the halls of the conference center.

The most lively and well-attended discussion focused on the Vision and Change movement to reform undergraduate biology education (<http://visionandchange.org>). With leadership from the National Science Foundation and the AAAS, Vision and Change has spawned discussions across the country on how to change what we teach to better reflect what we do as biologists. During this session, the Education Committee queried conferees for suggestions about how to respond to “calls for action” put forward by Vision and Change. The conferees unanimously requested examples of how to follow the Vision and Change recommendations, from video examples of how to actively engage students in learning to example papers that are well suited for use in teaching students at different levels of expertise. In addition, conferees asked for an annotated bibliography of evidence that the teaching practices being championed in this movement are effective. They plan to use this document to help convince college and university administration that change is needed and will be effective. The Education Committee will use these suggestions to guide future activities and resources to be featured at future meetings and on the new ASPB website.

Science Education Reference Center

This reference center was set up to provide numerous resources for meeting attendees to peruse. Books and sample journal volumes with information on best practices for teaching and learning and assessment strategies were available. Reprints of published pieces on framing science controversies for the public, the subject of the ASPB 2009 Education Workshop, and tips for publishing teaching scholarship were also available and popular with booth visitors. Be sure to look for more education references on the ASPB



Education Committee members Jane Ellis (front middle) and George Ude (back middle) discuss with booth visitors the 12 inquiry-based activities for plant biology.

education website and at the 2011 annual meeting in Minneapolis.

Materials and Methods

Over the course of the meeting, Education Committee members John Cushman (University of Nevada, Reno) and George Ude (Bowie State University) joined committee chair Erin Dolan (Virginia Tech) to talk with visitors about numerous education resources developed or sponsored by the committee and Education Foundation. Committee members handed out the ever-popular 12 Principles bookmarks. Several classroom-ready teaching materials were made available in pre-assembled packs that included a list of the 12 Principles, evolution of major plant groups, the Plants in Your Pants: Indigo worksheet, and Can you Grow a Chew-Ooey-Gooey-Chocolate Candy Bar? information sheet. The packets also contained information about the Teaching Tools in Plant Biology series developed by former committee chair Mary Williams (information available at <http://www.plantcell.org/teachingtools/teaching.dtl>) to help instructors teach plant biology courses. Sample materials from the Education Foundation-funded DNA for Dinner series, authored by Peggy Lemaux and Barbara Alonso (University of California, Berkeley), and the Fun and Games with Food and Genetics worksheet were on hand. The latter was accompanied by baseball cards on DNA, plant genomes, and plant breeding.

Information was also made available on the PlantingScience program, which is sponsored, in part, by ASPB. College and university faculty involved in PlantingScience serve as mentors to high school science students across the country.

Eye-Catching Concepts

Finally, booth visitors were treated to several eye-catching videos developed through different education initiatives. An overview of the Education Foundation-funded ChloroFilms (<http://www.ChloroFilms.org>) contest, coordinated by Dan Cosgrove (Penn State University), highlighted winning videos from the first contest. Web-based videos were shown from Plant Clippings, a series that was developed by Ken Korth (University of Arkansas) to accompany the 12 Principles. These fun and informative videos are available at <http://plantclippings.uark.edu>. A montage from the acclaimed sLowlife Exhibit developed from videos by Roger Hangarter (Indiana University) was also displayed.

For more information about the 2011 Education Booth competition or other education and outreach initiatives in development for the next meeting in Minneapolis, please contact Katie Engen at katie@aspb.org.

Merci, Montréal!

Chad Jordan
North Carolina State University
Erin Dolan
Virginia Tech

Education Workshop: Strategies for Broadening the Impact of Our Research

Past and current members of the Education Committee collaborated to present this year's education workshop, which highlighted ways to broaden the impact of plant biology research. Introductions at the start of the Saturday evening session revealed that the 40+ participants traveled from far and near, many from the United States and Canada but others from as far away as Jordan and Sri Lanka.

Erin Dolan (Virginia Tech), Education Committee chair, started the session by explaining the concept of "broader impacts," what constitutes a broad audience, and how to go about developing a plan to broaden the impact of research. Erin emphasized the need to listen to the individuals you are trying to reach to get a sense of their needs and interests; consider the resources and expertise you and those individuals have; and develop your plan to match needs, interests, resources, and expertise. For example, she recommended that those participating in education and outreach visit a classroom and ask students and teachers what they need, what they already are confident in knowing, and what their interests are before developing any plans to work with them.

Following these introductory remarks, workshop attendees rotated among four stations to participate in hands-on and inquiry-oriented lessons appropriate for K-12 and undergraduate students:

- The first station featured the much-anticipated 12 Activities for the 12 Principles of Plant Biology, a.k.a. the 12 Labs. Initiated in 2007 by Jeffrey Coker, Jane Ellis, and Mary Williams, and supported by the ASPB Education Foundation, the 12 Labs are based on the Principles of Plant Biology (<http://www.aspb.org/education/foundation/principles.cfm>) established by the ASPB Education Foundation. The 12 Labs are now available as PDFs on the ASPB



Everyone enjoys collecting and exploring the evidence at the education workshop.



Straining smashed strawberries

Strawberry Science: straining, setting up, and studying strawberry extract for easy access to DNA.



Setting up a tube of juice



Studying the tube of extract

website (<http://www.aspb.org/education/12Labs/>). At this station, conferees took a close look with Mary and Jane at Lab #12, Green Ecology and Rainbow of Uses (http://www.aspb.org/education/12Labs/labs/12_Plant%20Ecology.pdf),

and learned about investigations students could do with plant pigments.

- Jeffrey led everyone at the second workshop station to explore and discuss the pedagogical approach for the entire 12

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Education Workshop
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Labs. He also presented pedagogies for general biology education outreach.

- The third station was led by Larry Griffing (Texas A&M University) and showcased an undergraduate inquiry lab he teaches. For this lab, students identify organelles based on their characteristics when visualized using green fluorescent protein tags.
- At the fourth and final station, Erin led conferees in a DNA extraction activity suitable for adaptation to diverse ages and backgrounds and use as a starting point for discussing ideas in biotechnology and molecular genetics.

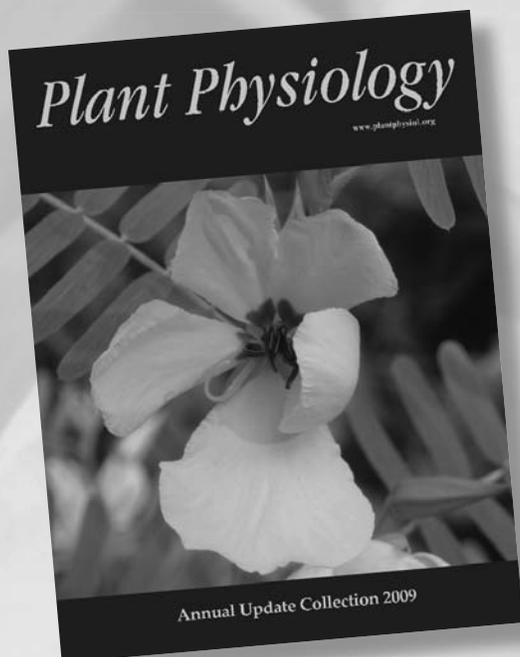
The workshop ended with advice about ways members can start their own education and outreach initiatives. Specifically, members can and should collaborate with individuals who have expertise in K–12 and undergraduate education, including teachers and science specialists, who are the points of contact for science teaching and learning within school districts. Other potential collaborators include faculty in science education departments at colleges and universities and informal and nonformal educators, such as people involved in 4-H, Boys & Girls Clubs, and science museums.

ASPB already is planning to facilitate future outreach initiatives. The theme for the Education Workshop at Plant Biology 2011

(August 6–10) in Minneapolis, Minnesota, is on writing grant proposals for education- and outreach-related projects. Principal investigators, who have received funding from the ASPB Education Foundation as well as through National Institutes of Health and National Science Foundation programs, will tell their stories and share their perspectives on what makes a successful education/outreach proposal. Based on feedback from ASPB membership to the Education Foundation and Education Committee, we anticipate that this will be a practical and enlightening event. Mark your calendars! 🌱

Erin Dolan
Virginia Tech

Plant Physiology® 2009 “Updates” Collection Now Available



The first *Annual Update Collection* brings together all the front-section Updates published in *Plant Physiology* in 2009, along with the prologue editorials written by the guest editors of that year’s three Focus Issues.

Updates review recent progress in the thematic areas covered by the Focus Issues (and more) and are written to be accessible and interesting for people reading them as an introduction to a particular topic, preparing for a lecture, or making classroom assignments.

The 2009 collection covers

- Grasses
- Plant Interactions with Bacterial Pathogens
- Legume Biology
- Five additional Updates

The *Annual Update Collection 2009* is available in a convenient printed format for only \$35 (shipping included). To order, visit <http://tiny.cc/utqij>.

Undergraduates Enjoy Overview of Plant Biology and Networking in Montréal

Among the nearly 1,500 participants at the 2010 ASPB/CSPP joint annual meeting in Montréal were approximately 70 undergraduates, including 16 ASPB Summer Undergraduate Research Fellowship (SURF) recipients. These students had the opportunity to hear about the latest research in plant biology, to network with colleagues around the world, and to present their own findings to an international audience, including during an undergraduate poster session with 32 posters held on the first day of the conference.

The poster session began with an introduction by Immediate Past President Sally Assmann (Penn State University), who not only inspired the undergraduates and recognized their research achievements, but also gave them practical tips for successfully navigating such a large meeting, including many that Sally reported using herself. Following the introduction, undergraduate participants discussed their work with other undergrads, mentors, and many other conference attendees during a lively and crowded presentation of their posters. After the session, the 2009 SURF recipients, several mentors, and SURF cochairs Ken Helm and Amy Clore joined for an informal luncheon where the students had the opportunity to build connections and develop professional relationships that may last throughout their careers. Posters were then relocated to the main exhibit hall, where authors had the opportunity to engage participants by presenting their research throughout the meeting. The quality of the



Past President Sally Assmann



undergraduate posters was impressive and noted by many.

When Ken and Amy spoke to several SURF recipients at their posters near the end of the session, the students reported that the meeting had been enjoyable, informative, and productive. They felt fully integrated into the proceedings through all of the scientific and social events, including during the final party where many of the 80s tunes were older than the students. The undergraduates also had the opportunity to meet their fellow students during the meeting, establish an undergraduate network of sorts, and make connections with other scientists from around the world. Everyone Ken and Amy talked to intends to pursue academic and/or research careers. The SURF cochairs



SURF cochair Ken Helm



SURF cochair Amy Clore

have no doubt that the future of plant biology research will be bright if these talented undergraduates are representative of those who will be conducting it. 

Amy Clore
New College of Florida

Ken Helm
Siena College

Plant Biology 2010 Education Minisymposium Promotes Maximum Outreach

The Education Committee–sponsored minisymposium at Plant Biology 2010 featured speakers representing a diverse set of effective outreach and educational programs designed to engage and train the next generation of plant scientists. In recognition of 2010 as the International Year of Biodiversity, the minisymposium featured Frederic Pitre from the Institut de recherche en biologie végétale at the Université de Montréal and the Montréal Biodiversity Centre at the Montréal Botanical Garden.

The Montréal Botanical Garden, which hosts 1.2 million visitors per year, was founded in 1935 by Herbar Marie-Victorin and is the second largest botanical garden in the world, after Kew Gardens in the United Kingdom. One of the core missions of the Montréal Biodiversity Centre, which is expected to open in the fall of 2010, is to house the existing collections of the Herbar Marie-Victorin herbarium (950,000 plant specimens), the Ouellet-Robert entomological collections (1,000,000 insect specimens), the Insectarium entomological collection (165,000 specimens), and the Cercle des Mycologues de Montréal (4,000 fungal specimens) in controlled environments. The preservation of these collections will aid the discovery and characterization of new species throughout Canada and the world using new tools such as digital image capture and high-throughput sequencing systems.

The Montréal Biodiversity Centre, which was funded by a CND\$16 million grant from the Canadian Foundation for Innovation, will feature innovative research and training programs for young scientists studying biodiversity, including a web-based querying system called Canadensys, which links collections databases and provides easy access to promote their use. The center is also expected to play a major role in raising public awareness of the threats to biodiversity and promoting solutions to preserve the natural



Speakers at the 2010 ASPB Minisymposium on Education and Outreach included (from left to right) David Lally, Uwe Hilgert, Jeffrey Coker, and Frederic Pitre, with session chair John Cushman.

wealth of Canada and the planet. This will be accomplished by dynamic, multimedia scientific exhibits, including a light and sound show illustrating the importance of the collections and of the study of biodiversity.

Jeffrey Coker, Elon University, presented the 12 Labs, a series of inquiry-based activities to accompany the 12 Principles of Plant Biology (which include the fundamentals of plant development and diversity). The activities were developed and tested by Jeffrey, Jane Ellis, and Mary Williams; funded by the ASPB Education Foundation Grant Awards Program; and endorsed by ASPB for K–12 education. These inquiry-based activities involve a series of simple classroom experiments that were developed, tested, and peer-reviewed in the CHAMPs program at Presbyterian College and at the Elon Academy at the Elon University. The activities were also tested in more than 25 classrooms throughout the United States. Jeffrey presented an overview of the different teaching modules, which use simple, inexpensive activities that are practical to implement in most classroom settings. All of the modules contain a background narrative that relates directly to

real-world issues encountered by students, with consistent format and pedagogy as well as instructions for teachers to encourage their use. Furthermore, each module is intended to be easily adapted to students' own open-ended experimental designs, encouraging students to perform their own authentic science investigations and to form spontaneous and engaged research communities. All materials are publicly available on the ASPB website at <http://aspb.org/education/12Labs> for use by ASPB members and for classroom use by teachers.

One of the most pressing issues for educators in the United States is how to accomplish meaningful science education reform. One solution was offered by David Lally, Virginia Tech, who presented an overview of Partnership for Research and Education in Plants (PREP): A Systems Approach to Plant Science Education, developed by himself and Erin Dolan, current ASPB Education Committee chair, also at Virginia Tech. This innovative program seeks to improve the effectiveness of science education by engaging scientists to work directly with, or integrate their college and university research activities with, K–12 students and teachers. Such systems integration seeks to overcome the traditional separation between K–12 schools and universities. Students grow and observe mutants and genetically engineered Arabidopsis plants provided by scientists using their own experimental conditions. The students are thus engaged in doing “real science” through active learning. Their discoveries may be included in peer-reviewed research publications or initiate new research projects that allow students to develop an improved understanding of

Plant Biology 2010 Education Posters: Expanding Classic and Current Resources to Educate Future Plant Scientists

Once again the ASPB annual meeting offered a robust selection of research posters. The Education Committee was pleased to find the work of scientists showcasing methods they use to engage K–12 and undergraduate students in thinking about and doing science among this year's education and outreach posters. In addition to the four presentations that were also featured as part of the education minisymposium (see article on page 40 of this issue), 11 posters highlighted instructional materials that are aligned with state and national standards, as well as experiments that are age appropriate and safe for classrooms.

Hanya Chrispeels and Gloria Muday (Wake Forest University) and Sangeeta Negi (Donald Danforth Plant Science Center) presented their effective efforts to use heirloom tomatoes as an instructional tool. Their extensive collection illustrates the diversity of plant form, which they use to teach standards-based concepts at elementary and middle school levels. Hanya and Gloria just received

funding from the Education Foundation's grant program to further expand and evaluate this effort. More details about this poster (#P04028) can be found at <http://abstracts.aspb.org/pb2010/public/P04/P04028.html>.

Michael Neff, Lori Sanderson, and Dan Tedor (Washington State University and Onalaska, Washington, School District) presented another example of a quality project in their poster. This trio "resurrected" a plant physiology lab exercise that illustrates the way that plants use light, not simply for photosynthesis but as a source of information. The activity is based on a 1952 publication from Borthwick and colleagues; thus their presentation also illustrated how classic papers can be used in classroom settings. Information about this poster (#P5005) is at <http://abstracts.aspb.org/pb2010/public/P05/P05005.html>.

A third intriguing example by Morgan Reitmeyer (Purdue University) combined meta-analytical and mixed methods approaches

to document how plants are featured across the media. Reitmeyer concluded by making recommendations for ways experts in plant science and English studies can collaborate to better feature plants using cutting-edge technologies. The abstract and contact information for this project (#P05006) can be found at <http://abstracts.aspb.org/pb2010/public/P05/P05006.html>.

The innovation and adaptation present in these and other research posters is evidence that many ASPB members are making deliberate progress in expanding and improving plant science education pedagogy and content. To participate in this facet of discipline-based education and outreach, you may wish to consider starting a project now so that you can submit a poster to Plant Biology 2011 (August 6–10) in Minneapolis.

George Ude
Bowie State University

Erin Dolan
Virginia Tech

Education Minisymposium *continued from page 40*

nature and the process of science. Future goals of the project are to enable students, teachers, and scientists to collaborate at any distance, engage across achievement levels, enhance reasoning and collaborations, and assess student knowledge and beliefs about science and scientists.

Uwe Hilgert, Cold Spring Harbor Laboratory, presented a talk on the novel education, outreach, and training programs associated with the iPlant Collaborative (<http://www.iplantcollaborative.org>), a National Science Foundation-sponsored project to develop computer (cyber) infrastructure that provides plant researchers and educators access to the large-scale datasets and high-powered informatics tools that now drive much of modern

biological research. One of the project's main goals is to support education of and outreach to students, educators at high schools and colleges, and practicing scientists. This goal will be promoted through development of discovery environments with innovative curricula and informal science programs that support the production and analysis of data. Featured projects included the DNA Subway (<http://dnasubway.org>), a program that presents complex scientific tools and data for gene prediction and structural annotation in an intuitive and appealing interface on which users "ride" different lines with defined workflows to perform scientific analyses. "Subway lines" feature gene family mining and discovery via comparison of gene sequence data to 18 other genomes to find similar genes from other plants. Additional projects

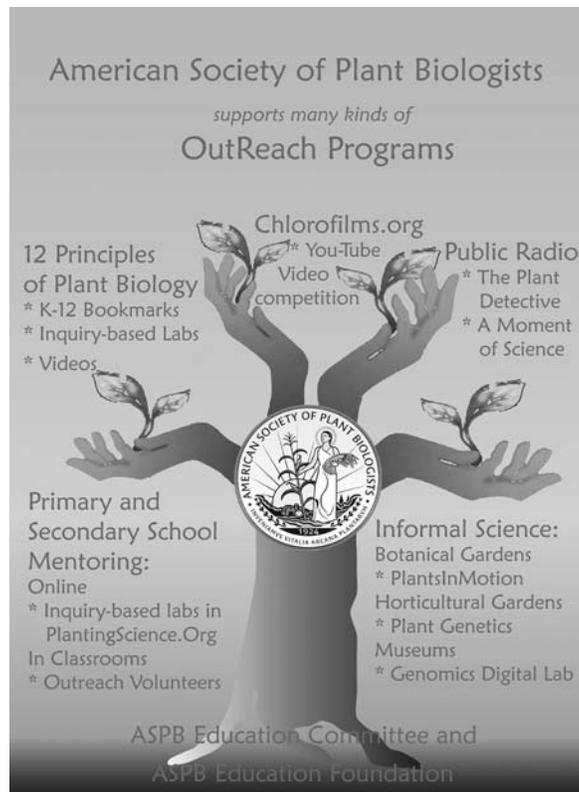
include DNA barcoding, which engages students in plant identification through short, standardized DNA regions. Students who amplify plant DNA and have these samples sequenced analyze their data using bioinformatics tools, advancing the goal of obtaining barcodes for all plant species. Lastly, students can engage in the Orphan Data project, which supports distributed research by connecting researchers who have underutilized datasets to faculty and students who wish to work with real data. An online marketplace will index projects with available "orphan data" so that these can be better used for classroom or independent research projects.

John Cushman
University of Nevada, Reno

It Takes the World to Raise a Scientist

The June 30–July 3 meeting of the Society for Experimental Biology (SEB, <http://www.sebiology.org>) in Prague, Czech Republic, included an international session on Academia: Mastering a Complex Career and provided clear insights into how the education of scientists often transcends the boundaries of nations. Instead of meeting in the United Kingdom, where the SEB has its headquarters and most of its members, meeting in Prague was perfect for discussing international science issues. Organized by Sarah Blackford, the SEB's head of education and public affairs, the session "described the key areas of academia on which incoming and aspiring academics should focus, including teaching, publishing, funding, and wider communication." I was pleased to represent ASPB at the meeting and discuss some of our Society's educational and outreach programs, in addition to participating in this session on building a career in academia and presenting some of my research in other sessions. The following is a summary of that international session.

After an excellent introduction to the session by Jeremy Pritchard (University of Birmingham, UK, and chair of SEB's Education Committee), Izabela Stanislawiszyn presented current trends in the education and ultimate placement of doctoral candidates and junior researchers in the European scientific community. Izabela is the current president of Eurodoc, the organization of European graduate students and early-career researchers, which conducted the survey upon which her comments were based. Among the results of the survey, it was found that gender differences were not as strong as expected, but that doctoral candidates with children have a harder time finding stable funding for their doctorate. In addition, although around 70% of the doctoral candi-



dates receive additional training that would open up job opportunities outside academia, a smaller proportion feel qualified for such jobs.

The second presentation, by Eugen Kvasnak from the Technology Transfer Office at Charles University in Prague, discussed commercialization of university-based research. Emphasizing the fact that 80% of the discoveries in applied research are patented and not published in peer-reviewed journals, he discussed how intellectual property rights are handled in European institutions. Getting a patent in the Czech Republic is very cheap (€5000 or about \$6,500). An underlying assumption of his presentation was that the academy could and should compete with industry directly, a view that could be debated further in the context of the role institutions of higher learning play in nation building and global competition.

Jeremy Pritchard and I presented our

perspectives on the role that teaching plays in academic careers in the United States and the UK. Jeremy focused on how the massive expansion of education in the UK, in terms of both students and institutions, is being accompanied by an emphasis on assessment. Hence, university teachers are using newer techniques, replacing didactic delivery with new approaches that facilitate student learning. I seconded these thoughts, pointing out that the U.S. National Research Council report *How People Learn* by John Bransford (and others) should be required reading for those who are trying to facilitate learning. I also discussed what kind of teaching is best done by faculty hoping for advancement in various types of institutions (two-year community colleges, four-year undergraduate colleges, and research universities), emphasizing the importance of stating learning objectives and providing assessment tools on how progress is made toward

those objectives. I noted that we clearly have a lot of work ahead in science education to overcome attitudes like that of the vice chancellor of Buckingham University who, according to *The Guardian* (June 29, 2010), has stated that scientists "are liars . . . They choose facts that suit their theories, they ignore inconvenient findings, then they try to bludgeon their colleagues into agreeing with them."

One way to overcome this deep suspicion of scientists found in many cultures would be to have a trial period, during which time scientists prove their worth. Interestingly, the career path of science faculty in some European countries includes a "habilitation" process, during which time young scientists follow up on their PhD and independently publish, teach, and acquire third-party funds. Teresa Valencak, a research fellow at the Veterinary University of Vienna, de-

scribed how this process, while not necessarily obligatory for tenure-track positions nor connected to a certain mode of employment, is a recognized practice in Germany, Switzerland, Austria, Russia, Poland, Hungary, and Slovakia. Although habilitation is not pursued in the UK, reflections on the path to a successful early research career by post-doctoral researchers were provided by John Bothwell (Queens University, Belfast, and one of this year's SEB President's medalists), who contributed to the authorship of the Research Councils' UK Concordat for the Career Development of Researchers (<http://www.researchconcordat.ac.uk>).

Communication with the public and schools (otherwise known collectively as "outreach") is becoming more important as universities strive to attract local students and explain their research and its broader impact, thereby justifying public funding. Dominic Delaney (Edvotech) gave some great advice on the general dos and don'ts for conducting practical science with schools. He also provided a hands-on demonstration to show how simple and affordable equipment can be used to demonstrate molecular biology in an exciting way to get young people thinking about how science works in the real world.

Publication is usually the major measure of scientific productivity by the academy. Irene Hames, managing editor of *The Plant Journal* and author of *Peer Review and Manuscript Management in Scientific Journals: Guidelines for Good Practice*, made a brilliant presentation on strategies and practical issues that can help early-career scientists get their work published and give it a competitive edge. She described the pitfalls (and how to avoid them) that arise in a publication climate that is changing fast. A major cause of the change is that submissions to journals are increasing rapidly, in part from scientists in countries that have not historically competed for acceptance in top-tier journals.

Finally, Carol Featherstone, a freelance science editor, described how to write a

first funded grant. In the UK, a personal fellowship is very important for achieving the autonomy necessary to set up your own research program and team. Carol drew attention to the variety of national and international organizations that provide opportunities and discussed how all are extremely competitive—each requires forward planning, presentation, and that all-important editing by a third party prior to submission.

Attending this meeting of SEB, which generously provided my registration and table space for materials from ASPB, helped me further appreciate the growing importance of the association between ASPB and other national and international organizations, especially the SEB. Mary Williams, now on staff at ASPB but living in Glasgow, helped represent ASPB at the SEB meeting in Glasgow last year and will probably do so at the SEB meeting in Glasgow again next year. SEB and ASPB have much in common. Both societies publish influential plant science journals, both are actively engaging the public through outreach in public education, and both are concerned with career development in the academy and industry. Formal and informal associations between societies

across the boundaries of nations—but with common missions—can shelter us from the changing winds of politics while potentially providing a platform from which we can speak with a common voice. In 2007, the U.S. National Academies published *Rising Above the Gathering Storm: Energizing and Employing America for a Brighter Economic Future*. This and other works that address the U.S. investment in STEM (science, technology, engineering, and mathematics) education have the potential to give rise to isolationist attitudes in the U.S. science community because they emphasize U.S. global scientific competitiveness. However, I believe it is in the national interest of all countries to participate in joint endeavors to inform and, by so doing, improve our ability to educate scientists.

Lawrence R. Griffing
Texas A & M University

Note: ASPB has joined with several other plant science organizations from around the world to establish the Global Plant Council and further unite the worldwide community of plant scientists (<http://www.aspb.org/PressReleases/GPC.cfm>).

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ASPB would like to highlight news coverage about plant science. If you or your research is being highlighted in newspapers, magazines, television, radio, movies, online, or other sources, please let us know! Just send a quick note, URL, and other relevant information to ASPB's public affairs director, Adam Fagen, at afagen@aspb.org.



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