

ASPB News



THE NEWSLETTER OF THE AMERICAN SOCIETY OF PLANT BIOLOGISTS

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President Barack Obama poses for a group photo with the recipients of the Presidential Early Career Award for Scientists and Engineers in the South Court Auditorium of the White House on December 13, 2010. Among the awardees are ASPB members Dominique Bergmann and Magdalena Bezanilla. (See page 9 for full coverage.) OFFICIAL WHITE HOUSE PHOTO BY CHUCK KENNEDY.

Honoring Those Who Serve the Mission of ASPB

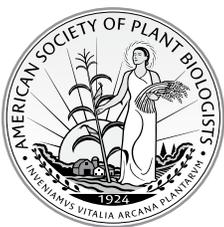
As outlined in our established mission, the American Society of Plant Biologists was founded to promote the growth and development of plant biology, to encourage and publish research in plant biology, and to promote the interests and growth of the plant science discipline. Our members work in academia, government laboratories, and industrial and commercial environments. Over the decades, the Society has evolved and expanded; our membership now spans six continents, and we play a key role in uniting the international plant science community.

Every one of our ASPB members knows someone whose unwavering dedication to this mission is truly inspiring. Perhaps the inspirational plant

scientist you're thinking of served as a mentor who instilled in you a lifelong ambition and dedication to our science. Or perhaps you envision a rising star who already demonstrates excellence early in his or her career. ASPB strives to recognize these individuals in many ways. One way is a call to service to the Society by nomination to ASPB's Executive Committee as elected member, secretary, or president, or to accept a president-elect's invitation to serve on one of the Society's many committees.

ASPB also honors excellence in research, education, outreach, and service through its numerous awards. In this new year, I'd like to encourage our

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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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Deadline for May/June 2011
ASPB News: April 5, 2011

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Welcome, Newest Members!

ASPB is pleased to welcome the following individuals, who joined ASPB in 2010. We hope that you continue to benefit from your membership for many years. Go to <http://www.aspb.org/membership> for more information regarding membership.

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Honoring Those Who Serve
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entire international community of members to turn their attention to nominations for the many ASPB awards we offer. As a major international society cognizant of its global attention and responsibilities, none of these awards is restricted to plant scientists residing in the United States, and up to three Corresponding Memberships are given each year specifically for noteworthy accomplishments by influential plant biologists residing outside the United States.

However, these individuals may never be recognized unless you step up and take the initiative to nominate them!

The selection committees rely heavily on receiving nominations from our membership, and so it is up to all of you to help us recognize plant biology's most deserving adherents. The nomination process is quite simple. Please visit the Society's website for a detailed description and history (http://my.aspb.org/?AF_Awards) of each of these awards and to obtain the details of the nomination process (<http://www.aspb.org/awards/nominate.cfm>). The online nomination form opened January 3, 2011, and will close March 1, 2011. Recipients of the awards will be notified in advance of our annual meeting.

For a list of the awards that ASPB will offer this year, please see the description in the previous issue of the *ASPB News* (<http://www.aspb.org/newsletter/novdec10/02nominate2011.cfm>). For information about last year's awardees, please see the article in the September/October 2010 issue of the *ASPB News* (<http://www.aspb.org/newsletter/septoct10/06awards.cfm>).

I am pleased to announce that a new award, the **Eric E. Conn Young Investigators Award**, will be given for the first time in 2011. For a description of the Eric E. Conn Young Investigators Award, please see a second article in the September/October 2010 issue of the *ASPB News* (<http://www.aspb.org/newsletter/septoct10/07ericconn.cfm>). The award honors Eric Conn's contributions to plant biology by recognizing young scientists who will be inspired to follow in his footsteps. It recognizes demonstrated excellence in outreach, public service,

mentoring, or teaching by plant scientists at the beginning of their career. This award is made for demonstrated commitment by a member of the Society who is not more than five years postdoc on January 1 of the year of the presentation. It also provides a one-year membership to the Society.

Among the other awards to be presented this year is the **Stephen Hales Prize**, one of our Society's oldest and most prestigious awards. This award, established in 1927, was named for Reverend Stephen Hales, who is considered to have created the field of plant physiology in the publication of the book *Vegetable Statics* 200 years earlier. The annual award honors scientists for lifelong service to the science of plant biology. The recipient of the award is invited to address the Society on a subject in plant biology at the subsequent annual meeting. Our most recent recipient was Sakis Theologis, for his 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.

The **Charles Albert Shull Award** was created in 1971 to honor the Society's founding father and the first editor-in-chief of *Plant Physiology*. This annual award is designed to recognize young researchers, 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 also invited to address the Society at the annual meeting the following year. Last year's recipient was Dominique Bergmann; she was recognized for her work on understanding cell polarity and asymmetric cell division and their relationship to cell fate.

The **Charles Reid Barnes Life Membership** is ASPB's oldest award, established through the generosity of Dr. Charles A. Shull at the first annual meeting of the Society in 1925. 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. J. Derek Bewley, whose research

interests range from desiccation tolerance in mosses to investigations of dormancy mechanisms in seeds, was our most recent recipient.

The **Martin Gibbs Medal** was established in 1993 to honor Martin Gibbs, the longest serving editor of *Plant Physiology*. The Gibbs Medal is presented biennially to an individual who has pioneered advances that have served to establish new directions of investigation in the plant sciences. The winner will receive the medal and will be invited to convene a Martin Gibbs Medal Symposium at the annual meeting the following year. John Ohlrogge was the 2009 winner for his pioneering work in understanding fatty acid metabolism in plants.

The **Excellence in Education Award** was initiated in 1988 to honor outstanding teaching, mentoring, and/or educational outreach in plant biology. This award is 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 is our most recent winner, for her long history as an outstanding plant science educator, piloting outreach programs such as the inquiry-based activities to illustrate the 12 Principles of Plant Biology for middle school and high school teachers around the country.

The **Corresponding Membership Award**, first given in 1932, honors up to three distinguished plant biologists residing outside the United States and provides life membership and Society publications. This award requires the approval of the entire Society by ballot. Last year's winners were Sudhir K. Sopory, Hartmut Lichtenthaler, and Geoffrey Fincher.

The **Early Career Award** was instituted in 2005 to recognize outstanding research by scientists at the beginning of their career. This award is made annually for exceptionally creative, independent contributions by a member of the Society who is not more than five years postdoc on January 1 of the year of the presentation. Our most recent winner was R. Keith Slotkin, a newly appointed assistant professor already recognized for his significant contributions in the field of

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The Department of Defense and the National School Lunch Program

In 2010, more than 100 retired generals, admirals, and senior leaders of the U.S. Armed Forces issued a summary report stating that more than one in four young Americans were unfit for military duty as a result of being overweight or clinically obese (1). They made several straightforward and concrete recommendations to solve the problem



Nick Carpita

of young Americans being “too fat to fight,” an epidemic regarded as a threat to national security: (a) get junk food and high-calorie beverages out of our schools; (b) increase funding for the school lunch program; and (c) support the development, testing, and deployment of proven public health interventions.

This is not the first time that the Department of Defense (DoD) has sounded an alarm about the endangered health of our nation's youth. In fact, it was the testimony of Major General Lewis B. Hershey, then head of the U.S. Selective Service Administration, and work with the U.S. Department of Agriculture (USDA) that won passage of legislation that inaugurated the national school lunch program in 1946 (2). Individual states and the USDA had first responded in the early 1930s to the growing problem of malnutrition, largely a result of food shortages and distribution problems during the Great Depression, by establishing regional school breakfast and lunch programs (3). However, these programs declined during WWII, and by 1946, the DoD reported that a shocking four in five Americans were unfit for military service, the primary cause being malnutrition. In signing the Richard B. Russell National School Lunch Program legislation, President Harry Truman commented that “In the long view, no nation is healthier than its children, or more prosperous than its farmers.” America's youth, regardless of family income, were assured at least one healthy meal a day, and farmers

were guaranteed a substantial market for their commodities. Except for an austere cost-cutting downturn in funding in the 1980s (older ASPB members may recall when ketchup was declared to be a vegetable...), the program has grown steadily to the point at which it now gives 31 million children a daily meal.

Although nutrition programs for school children are available in most developed countries, food security in developing countries is another matter. In fact, two former political foes, Bob Dole and George McGovern, teamed up in a common cause to bring the idea of a school breakfast/lunch program to developing countries where, as in the United States in the 1930s and 1940s, malnourishment had to be addressed as a prerequisite to effective learning. Their international school lunch program had another bonus by including girls, who were too often left out of the education loop. Widely successful in Africa, the program has spread to 41 countries worldwide and now benefits an estimated 22 million children. In fact, the program has been so successful that McGovern and Dole were awarded the 2008 World Food Prize for global commitment to the idea that educating a mind must begin with a healthy body (4).

However, there is a long way to go. In announcing the “1,000 Days: Change a Life, Change the Future” initiative, the United Nations Millennium Development Program and its partners aim to guide action to address the problem that 200 million children around the world suffer from chronic malnutrition, a situation that results in 3.5 million preventable maternal and child deaths annually as well as stunting of the growth and intellectual capacity of one-half of all children (5). Moreover, child malnutrition before the age of two is one of the world's more serious yet

avoidable problems, affecting intellectual capacity, educational performance, and human potential long before a child steps into a classroom. Although improving the health of the populations of developing countries is a long-standing mission of a great many developed nations, private foundations, in particular the Bill and Melinda Gates Foundation (6), have focused world attention on the premise that improving health and local agriculture go hand in hand.

What constitutes a lunch in the United States has changed radically over the decades. The USDA reports that U.S. children are overfed yet malnourished—one in four children suffer hunger—while at the same time, the U.S. Centers for Disease Control and Prevention (CDC) reports that as a result of obesity and poor nutrition, one in three U.S. children will develop Type II diabetes in their lifetime, one in two if they are African-American or Hispanic (7). Although a fast-food culture, our insatiable appetite for sugar, and a failure to battle these trends within the confines of a schoolyard contribute greatly to childhood obesity, the success of large-scale agriculture and the trajectory of our commodity markets indirectly contribute as well. In the 1960s, Secretary of Agriculture Earl Butz reconfigured price supports that, in effect, ended subsidies for idle lands and replaced them with a guarantee of a floor price—a policy that encouraged farmers to grow corn and soybeans “fencepost to fencepost,” maximizing production to create new markets (8). Since 1970, average U.S. corn yields have risen from 97 bushels per acre (6.1 metric tons per hectare) to about 165 bushels per acre (10.4 metric tons per hectare). Last year, it is estimated that the United States produced a little over 13 billion bushels (335 million metric tons) of corn (9). Where does it go? About 43% will go to animal feeds, 32% will be convert-

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ed to ethanol (and animal feed by-products), 16% will be exported, 5% will be converted to high-fructose corn syrup and sweeteners, and 2% will be consumed directly by humans in products such as cereal, corn meal, and corn starch (10). That's right: a market was created in which 2.5 times more corn goes to making corn sugar than actual corn food products.

An impending health epidemic is driving change. The U.S. National Institutes of Health (NIH) have announced two programs amounting to over \$70 million to prevent or treat downstream consequences of the obesity epidemic and to study community efforts to reduce incidence (11). Meanwhile, the \$25 million Childhood Obesity Prevention Program at USDA's National Institute of Food and Agriculture (NIFA) aims to generate knowledge about behavioral and environmental factors that influence excessive weight gain by children and to develop means of intervention (12). The NIFA program also aims to develop effective means to increase nutritious foods, decrease high fat and high sugar intake, and alter the obesity culture. Private individuals and foundations have been doing their part as well, from the Robert Wood Johnson Foundation, whose key missions are to improve American health and end childhood obesity (13), to British chef Jamie Oliver's private Food Revolution campaign that offers a far-reaching educational platform that teaches good eating habits within affordable budgets (14).

Almost lost in the news of all the congressional actions this past December was the strong bipartisan support for the Healthy, Hunger-Free Kids Act, a program strongly championed by First Lady Michelle Obama and signed into law on December 13, 2010 (15). This legislation reinforces USDA authority to restructure and expand coverage of school breakfast, lunch, and after-school programs to provide more healthy and nutritious foods as well as to educate children about healthy food choices. Long in advance of its passing, the USDA has developed several competitive grant programs that emphasize basic research into keeping American agriculture competitive

while ending world hunger, improving nutrition, ending child obesity, and improving food safety. Even special programs in foods, nutrition, and health, such as the Specialty Crop and the Organic Agricultural Research initiatives, touch on plant biology, genetics, and genomics (16).

In the long view, plant biologists are at the foundation of the food revolution. Much is already being done through basic research by ASPB members to enhance nutritional yield, vitamin quality, and even disease-mitigating traits of crop plants through advanced genetics. But so much more could be done with a reprioritization of funding. Echoing Benjamin Franklin's adage "An ounce of prevention is worth a pound of cure," the \$70 million that NIH now devotes to the downstream health consequences of obesity, a mere 0.25% of its research budget, added to the USDA competitive research budget could profoundly impact advances needed not only to solve our own epidemic, but also to provide the varieties and technologies that mitigate malnutrition worldwide. A significant change in the funding structure in these vital areas could come in 2011 when hearings begin on the new Farm Bill. Not to underplay the complexities inherent in the formulation of this bill, but when the dust settles, surely a path can be constructed to significantly change and support the basic and applied research and agricultural programs that encourage the local production of healthy and nutritious food crops—and make them less expensive than high-fructose corn syrup. 

Nick Carpita

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ASPB Members Receive Honors from President Obama

Two ASPB members are celebrating a White House honor. Dominique Bergmann and Magdalena Bezanilla are among the 85 researchers named by President Barack Obama as recipients of the Presidential Early Career Awards for Scientists and Engineers, the highest honor bestowed by the U.S. government on science and engineering professionals in the early stages of their independent research career. They received their awards in a ceremony at the White House on December 13, 2010.

Dominique is assistant professor of biology at Stanford University. Her laboratory has made notable contributions to elucidating the development of plant stomata as well as to our understanding of cell fate and patterning in plants and other multicellular organisms. She earned her PhD at the University of Colorado at Boulder and conducted postdoctoral research at the Carnegie Institution for Science's Department of Plant Biology. Dominique was the 2010 recipient of ASPB's Charles Albert Shull Award, which is made annually for outstanding investigations in the field of plant biology by a scientist who is younger than 45 years of age or who is fewer than 10 years from the granting of the doctoral degree. In conjunction with her receipt of the 2010 Shull Award, Dominique will be speaking as part of the awards symposium at ASPB's Plant Biology 2011 meeting.

Magdalena is associate professor of biology at the University of Massachusetts Amherst. Her laboratory pioneered a model system for



Magdalena Bezanilla and Dominique Bergmann

studying plant tip growth, which is integral for processes such as fertilization and the absorption of water and minerals by plant roots, and has made significant contributions establishing molecular links between the actin cytoskeleton within plants and cell growth. She earned her PhD from the Johns Hopkins University School of Medicine and conducted postdoctoral research at the Salk Institute for Biological Studies and Washington University in St. Louis. Magdalena has also been honored as the 2010 recipient of the American Society for Cell Biology's Women in Cell Biology Junior Career Recognition Award, which honors exceptional scientific contributions to cell biology and demonstrated potential for continued scientific achievement and leadership.

The Presidential Early Career Awards were established by President Bill Clinton in 1996 and are coordinated by the Office of Sci-

ence and Technology Policy (OSTP) within the Executive Office of the President. Awardees are selected for their pursuit of innovative research at the frontiers of science and technology and for their commitment to community service, as demonstrated through scientific leadership, public education, or community outreach. Recognized scientists and engineers have received research grants for up to five years to further their studies in support of critical government missions.

The awards are conferred annually at the White House following recommendations from participating agencies. Dominique was selected following her receipt of a research grant from the National Institutes of Health, and Magdalena was selected on the basis of a Faculty Early Career Development (CAREER) Award from the National Science Foundation.

As quoted in a release from OSTP, President Obama said, "Science and technology have long been at the core of America's economic strength and global leadership. I am confident that these individuals, who have shown such tremendous promise so early in their careers, will go on to make breakthroughs and discoveries that will continue to move our nation forward in the years ahead."

Adam P. Fagen, PhD
ASPB Public Affairs Director

Honoring Those Who Serve *continued from page 6*

plant epigenetics and transposable element silencing.

Finally, the **Fellow of ASPB**, established in 2007, is 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. The Fellow of ASPB honor may be granted to no more than 0.2% of the current membership each year. A complete list of the Fellows of ASPB by year can be found online at http://my.aspb.org/?AF_Awards#fellows.

In addition to these awards, we also offer the **ASPB-Pioneer Hi-Bred Graduate Student Fellowship**. This fellowship is made possible by the generosity of Pioneer Hi-Bred International and recognizes and encourages innovative graduate research and innovation in areas of plant biology that relate to impor-

tant commodity crops. Each nominee must be a PhD candidate, attend a U.S.-accredited college or university, and demonstrate interest in the study of plant biology or a related discipline. Ashley Galant is the 2010 recipient of the award. She studies oxidative stress in soybean, an important crop plant that is especially sensitive to ozone.

Nick Carpita
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<http://www.aspb.org/awards/nominationform.cfm>

ASPB and Wiley-Blackwell Partner on New Book Series

Susan Singer Named Series Editor

Nearly 10 years ago, ASPB joined forces with John Wiley & Sons in the marketing and distribution of the Society's groundbreaking textbook, *Biochemistry & Molecular Biology of Plants*, edited by Bob B. Buchanan, Wilhelm Gruissem, and Russell L. Jones and first published in July 2000. Now Wiley-Blackwell and ASPB will copublish a long-anticipated second edition, updated and refreshed to reflect the latest advances in the field. The second edition is expected to publish in 2012 in both print and electronic formats.

An Engaging New Resource for Students and Teachers Alike

Building on the success of *Biochemistry & Molecular Biology of Plants*, ASPB and Wiley-Blackwell are pleased to announce an exciting new joint venture: a series covering core topics in plant biology. Focusing on key themes for undergraduate and graduate studies, the series will cover a wide range of topics of interest to the ASPB membership.



Susan Singer

We are delighted to announce Professor Susan Singer of Carleton College as series editor. Susan brings with her a wealth of experience in plant biology teaching and research, as well as in writing major undergraduate textbooks. Having won the ASPB Excellence in Teaching Award and

having served on a wide range of education and research committees, currently including the National Research Council's Board on Science Education, Susan is very well placed to develop the series into a key resource for students and teachers alike. As series editor, she is looking forward to commissioning and developing books that address state-of-the-art topics in plant biology: "The Wiley-Blackwell partnership will leverage the vast research expertise of the membership with ASPB's excellence in and commitment to education in furthering plant biology teaching and learning. Faculty will be able to select texts and resources from the series to

customize cutting-edge plant biology courses for today's students."

Be Involved!

We would like to hear from ASPB members with ideas for this prestigious new series, and in particular anyone interested in being an author. If you teach a course for which you have labored over notes but can't find a suitable textbook, or if you feel there is a need for a book to bring new researchers up-to-date with the very latest developments, why not get in touch and propose the topic for the series? The involvement, ideas, and feedback of the ASPB membership will be vital in helping shape the series to meet the needs of plant biologists today and tomorrow. For more information about the series, including how to contribute and a promotional discount on books for ASPB members, please visit <http://www.wiley.com/go/aspb>. Don't forget to check back for updates as the series develops. We look forward to hearing from you!

Rachel Wade, PhD
Commissioning Editor for Plant Sciences
John Wiley & Sons

ASPB-Pioneer Hi-Bred Graduate Student Fellowship

Nominations Due by Tuesday, March 1

The ASPB-Pioneer Hi-Bred Graduate Student Fellowship, made possible by the generosity of Pioneer Hi-Bred, recognizes and encourages innovative graduate research and innovation in areas of plant biology that relate to important commodity crops, including corn, soybeans, rice, wheat, or canola. 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 (have successfully passed their preliminary examinations), must demonstrate an excellent academic record (e.g., have achieved undergraduate and graduate GPAs of 3.5 or greater), and must be a member of ASPB. An individual may receive this fellowship only once.

Applications now being accepted.

For more information, see <http://aspb.org/awards/nominate.cfm>.



Plant Biology 2011

*Minneapolis
August 6-10*

<http://aspb.org/PlantBiology2011>



**American Society
of Plant Biologists**

Cultivating a better future through plant biology research

Plant Biology 2011 Call for Abstracts

Abstract Submission Opening January 2011

Read How ASPB Minisymposia Are Selected at
<http://www.aspb.org/meetings/pb-2011/abstracts/selectionprocess.cfm>

The abstracts and program details will be available for viewing and searching online in April 2011. The website will make it possible for you to prepare and print out a personal itinerary to guide you at the meeting.

Travel Grant Applicants: please submit your application abstract through the Travel Grant Application process online. Submitting for Plant Biology 2011 will *not* automatically submit you for a travel grant.

The Plant Biology format will include six major symposia and up to 30 minisymposia based primarily on the abstracts submitted under the topic categories listed in the sidebar. The Program Committee determines the titles and contents of the minisymposia after reviewing the submitted abstracts. Oral presentations are required for those abstracts selected for minisymposia. Suggestions for minisymposia topics are welcomed and should be submitted online.

In addition to the scientific abstract submission, there is a field on the form titled "Broader Impacts." Please use this field to describe novel education outreach activities. This submission (600-character limit) will serve as the basis for selection of a special Education and Outreach minisymposium.

Categories are purposely broader than in previous years. Keyword selections are added to the submission process to assist with the selection of minisymposia and searching of abstracts.

There will be no printed abstract book this year. Instead, memory sticks with the full abstracts will be provided to attendees. Titles and authors only will be printed in the program book.

GUIDELINES

- A member of ASPB may submit or sponsor only ONE abstract.
- A \$50 fee will be required for each abstract and will **be refunded as a rebate within 30 days of receiving paid registration** for the abstract submitter or the registrant designated by the submitter.
- Registration is required by the last day of preregistration: June 24, 2011. Otherwise, your abstract will be deleted from the online listing, and no poster space will be reserved.
- The body of your abstract cannot exceed 1,800 characters (including spaces).
- DO NOT include any graphics or tabular material in the body of your abstract.
- Follow the online instructions for inserting special characters, superscripts, or subscripts.
- Proofread your abstract, double-checking any special characters.
- Select a topic category from the list in the sidebar.
- If you wish your abstract to be considered for a minisymposium or talk, please indicate so on the online form.

SUBMISSION DEADLINES

- Abstracts must be submitted via the web* at <http://www.aspb.org/abstract>.
- To be considered for inclusion in a minisymposium, submit abstract by March 11, 2011. Posters may be submitted at any time abstract submission is open.
- For inclusion in the memory stick abstract listings, submit by May 27, 2011.

* The online submission form provides an author the opportunity to request that an abstract be presented only by poster.

CATEGORIES

Applied Plant Biology

Biochemical Processes and
Macromolecular Structures

Cell Biology

Development

Education and Outreach

Environmental Stress and
Adaptation to Stress—

Subcategories:

- General
- Metal
- Cold
- Heat
- Salt
- Light
- Nutrient
- Drought

Gene Regulation and
Molecular Biology

Genetics, Genomics, and
Molecular Evolution

Hormone Biology

New Model Systems and
Technological Advances

Plants and Human Health

Plants Interacting with
Other Organisms

Signal Transduction

Systems and Computational
Biology and Bioinformatics

Whole Plant and
Ecophysiology



Members in the News

Maarten Chrispeels has been elected a foreign corresponding member of the Academia Chilena de Ciencias (the Chilean Academy of Sciences). He also recently received the 2010 International Plant Nutrition Award from the International Crops Research Institute for the Semi-Arid Tropics.

In addition, Maarten was named director of ScienceBridge, an organization that brings research from the University of California, San Diego (UCSD) to San Diego-area high schools. Among the ScienceBridge programs is Socrates, which engages UCSD PhD students in working with local high school teachers and students and in learning to be better science communicators. His appointment was profiled in an October 24 article in *North County Times* (<http://bit.ly/f4XCTJ>).

Maarten is distinguished professor emeritus of biology at UCSD and a member of the National Academy of Sciences. He was on the editorial board and served as associate editor and later editor-in-chief of *Plant Physiology*. He was the 1996 recipient of ASPB's Stephen Hales Prize and was named an inaugural Fellow of ASPB in 2006.

Erin Dolan is the new editor-in-chief of *CBE-Life Sciences Education* (<http://www.lifescied.org>), a peer-reviewed journal of life science education research and evidence-based practice across all areas of the life sciences. This online, open access journal is published quarterly by the American Society for Cell Biology and funded, in part, by the Howard Hughes Medical Institute. In her first editorial, Erin mentioned her interest in publishing research and evidence-based practices to help overcome "institutional and cultural barriers that prevent widespread employment of effective instructional practices." Erin is associate professor of biochemistry at Virginia Tech, where she serves as outreach director of the Fralin Life Science Institute. She is also current chair of the ASPB Education Committee.

Russell Jones was awarded the Berkeley Citation on November 19 in honor of his distinguished service to the University of California, Berkeley. Russell is professor of plant biology and former chair of the Department of Botany and the Lawrence Hall of Science Advisory Committee. He studies how plants respond to environmental signals, especially hormones and other regulatory molecules; his research has focused on the biochemistry and molecular biology of seeds, in particular seed dormancy and germination. Russell was ASPB president from 1993 to 1994 and was an associate editor for *Plant Physiology*. He was coeditor of the textbook *Biochemistry & Molecular Biology of Plants* and will be an academic editor on the forthcoming second edition and a coauthor on a new title due off press later this year called *Molecular Life of Plants*. Both are copublished by ASPB and John Wiley & Sons.

"Teaching with Tomatoes," an educational program developed by **Gloria Muday** and **Hanya Chrispeels** (Maarten's daughter) in collaboration with education professor Michelle Klosterman and biology professor Carole Browne, was featured in the September 9 issue of the Winston-Salem, North Carolina, *The Chronicle* (<http://bit.ly/f8c6XZ>). With support from the ASPB Education Foundation, this program uses the familiar tomato plant to teach K-12 students basic principles of genetics. Gloria is professor of biology at Wake Forest University and an elected member of the ASPB Executive Committee; Hanya is a postdoctoral researcher at Wake Forest.



Maarten Chrispeels



Erin Dolan



Russell Jones



Gloria Muday



Hanya Chrispeels

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Members in the News
continued from page 13

Pamela Ronald, professor of plant pathology at the University of California, Davis, was a guest on *The Dr. Oz Show* on December 7, talking about plant genetics. She was also a participant in an online debate hosted by *The Economist* about whether biotechnology and sustainable agriculture are complementary. Pam blogs at *Tomorrow's Table* (<http://scienceblogs.com/tomorrowsstable>) and is the coauthor of *Tomorrow's Table: Organic Farming, Genetics, and the Future of Food* (Oxford University Press, 2008).



Pamela Ronald

Richard Sayre and **Robert Blankenship** were guests on St. Louis Public Radio's November 29 *St. Louis on the Air* program (<http://bit.ly/etsPG9>). They discussed the contributions of plant science research to addressing the nation's energy challenges. Richard is director of the Enterprise Rent-A-Car Institute for Renewable Fuels at the Donald Danforth Plant Science Center, and Robert is the Lucille P.



Richard Sayre



Robert Blankenship

Markey Distinguished Professor of Arts and Sciences and director of the Photosynthetic Antenna Research Center at Washington University in St. Louis.

Kay Walker Simmons has been appointed as deputy administrator for crop production and protection at USDA's Agricultural Research Service (ARS), effective November 22, 2010. In this role, she will provide program planning and coordination leadership for ARS's large national portfolio of crop science, production, and protection research. Kay was previously national program leader for plant genetics and grain crops at ARS. In her own research, she identified new molecular processes regulating wheat seed germination and seedling tolerance of cold and drought stress.



Kay Walker Simmons

Compiled by **Adam P. Fagen, PhD**
ASPB Public Affairs Director

Share Your Moment in the Spotlight with ASPB Members!

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.



Jim Carrington Named as Next President of Danforth Plant Science Center



Jim Carrington in front of the Danforth Plant Science Center. PHOTO COURTESY OF THE DANFORTH PLANT SCIENCE CENTER.

ASPB member Jim Carrington has been selected to serve as the next president of the Donald Danforth Plant Science Center. Jim has been a member of ASPB since 1996 and served on the editorial board of *The Plant Cell* from 1996 to 2003. He will assume his position at the Danforth Center on May 1, taking over for Phil Needleman, PhD, who has been acting president since the Danforth Center's founding president emeritus, Roger Beachy, was named inaugural director of the National Institute of Food and Agriculture at the U.S. Department of Agriculture in 2009.

The Danforth Center is the world's largest independent research institute dedicated to plant science. With a \$20 million annual budget, it employs more than 200 people, including 80 PhDs, at its St. Louis research and training facility and enjoys collaborations around the world. The center will also be looking to hire additional scientific staff and will focus on those who are highly integrative and can work across a broad range of plant science. This expansion will be helped by a \$70 million grant the center recently received from the Danforth Foundation, one of the foundation's last major grants before shutting its doors in mid-2011.

ASPB President Nick Carpita said, "The Danforth Center has made an excellent choice for its new president. Jim's research background and leadership experience make him particularly well qualified to carry forward the Danforth's fine tradition of addressing the grand challenges we face today."

In fact, in an interview with ASPB, Jim mentioned that the four challenge areas identified in the National Research Council's 2009 report *A New Biology for the 21st Century*—environmental protection, sustainable fuels, nutritious foods, and improving human health—"have their solutions firmly rooted in plant science."

Jim described the unique role of the Danforth Center in "applying fundamental

knowledge to vital societal needs around the world," citing examples of improving the nutritional quality of cassava, an important staple crop in sub-Saharan Africa, and enabling new sources of renewable fuels. The work of the Danforth Center spans the pathway from fundamental discovery through product and safety testing to implementation and dissemination of novel plants with desirable characteristics. Jim expects the long-term legacy of the center will focus on taking "those basic discoveries made at the Danforth Center and other places and plugging them in to address big problems that serve humanity."

Jim is currently distinguished professor of botany and plant pathology and director of the Center for Genome Research and Biocomputing at Oregon State University. He is well known for his research on small RNA molecules, gene silencing, and interactions between viruses and their host.

ASPB member Steve Kay, dean of the Division of Biological Sciences at the University of California, San Diego, characterized Jim's contributions, saying that he "is recognized worldwide for his leadership in plant genomics and virology. His work on identification of small RNAs and their roles in plant development have had a major impact in science across all fields."

Former ASPB President Ralph Quatrano, dean of the School of Engineering and Applied Science at Washington University in St. Louis, welcomed Jim to the "very strong plant community" in St. Louis, saying that Jim is a "terrific choice" because of the high quality of his research, the importance of his research, and "his ability to build further the next decade of the Danforth Plant Science Center."

Adam P. Fagen, PhD
ASPB Public Affairs Director

This article was originally published in the Chronicle Online and is reprinted here with permission.

Electrons Can't Exceed the Speed of Light—Thanks to Light Itself, Says Biologist

When resolving why electrons can never beat the speed limit set by light, it might be best to forget about time. Thanks to insight from studying movement inside a biological cell, it seems that light itself—not the relativity of time—may be the traffic cop, according to a Cornell biologist.

Any space with a temperature above absolute zero consists of photons. As a result of the Doppler effect, the moving electron experiences the photons crashing into the front of it as being blue-shifted, and the photons colliding with the back of it as being red-shifted. Since blue-shifted photons exert more momentum than red-shifted photons, the photons themselves exert a counterforce on the moving electron, just as the cytoplasm in a cell exerts a viscous force on the moving organelles. The viscous force that arises from the Doppler-shifted photons pre-

vents electrons from exceeding the speed of light, according to Randy Wayne, associate professor of plant biology.

Wayne's research, "Charged Particles Are Prevented From Going Faster Than the Speed of Light by Light Itself: A Biophysical Cell Biologist's Contribution to Physics," appears in the November 2010 issue of *Acta Physica Polonica B*.

On determining whether electrons can surpass the speed of light, Albert Einstein's special theory of relativity contends that electrons are prevented from exceeding the speed of light as a result of the relativity of time. But Wayne contends that Einstein didn't take the environment through which the electrons move into account.

"Given the prominence of viscous forces within and around cells and the experience of identifying and quantifying such resis-

tive forces, biophysical cell biologists have a unique perspective in discovering the viscous forces that cause moving particles to respond to an applied force in a nonlinear manner," he explained. "Consequently, light itself prevents charged particles from moving faster than the speed of light."

Wayne will publish a related paper, "The Relativity of Simultaneity: An Analysis Based on the Properties of Electromagnetic Waves," in a forthcoming volume of the *African Physical Review*, which is a juried publication.

Submitted by Randy O. Wayne
Associate Professor of Plant Biology
Cornell University

You Spoke and We Listened: *Plant Physiology* Eliminates Surcharges

Beginning in January 2011, all article pages in *Plant Physiology* will cost the same—the extra fee for each page over 10 will be eliminated. The surcharge was originally instituted in 2006 to encourage tightly written manuscripts and discourage significant repetition between the Results and Discussion sections. However, after speaking with many of you, it has become apparent that concise writing is not enough; the amount of information necessary to report research of high quality has increased, and the average length of an article in *Plant Physiology* is now 13 pages.

Although we still believe that tightly written papers improve the impact of what we publish and encourage concise manuscripts, we want you to be able to tell your story without being constrained. We thank you for submitting your best work to *Plant Physiology*.



Lessons from the Path Less Traveled

by Robyn M. Perrin, PhD

Patent Agent, Casimir Jones, S.C.

When I was asked by the ASPB Women in Plant Biology Committee to write this article, I thought of all the wise women of ASPB that I have had the privilege of knowing. After glancing over past articles in the series (<http://www.aspb.org/newsletter/wipb.cfm>), I wondered how best to compose my thoughts.



Robyn Perrin. PHOTO BY CLINT THAYER.

A biographical or career advice article seems premature. At age 35, I still have absolutely no idea what I want to be when I grow up. I hope that remains the case for many more years.

Since earning my PhD in 2001, I have had the good fortune of embarking on a random career walk that has involved time well spent in academia (two postdocs), technology transfer (an internship at the Wisconsin Alumni Research Foundation), the corporate world (technical writer), and private legal practice (registered patent agent), as well as moonlighting as a coentrepreneur. That said, I cannot offer a blueprint for replicating the experience—nor would it be relevant to anyone else even if I could. So much of what happens in one's profession is sheer serendipity.

But here are three pieces of advice that have served me well so far, so I'd like to pass them along.

Break Free from Comfortable Niches

In other words, ignore boundaries. Any boundaries. Scientific boundaries, for example, keep researchers trapped within narrow fields of specialties, unaware of a relevant technique or piece of information from other areas. Time may seem too scarce to attend a seminar on a subject well outside the research project at hand, but staying within the well-traveled path can lead to well-traveled

thinking. And there are times when a broad viewpoint is advantageous. As a patent agent, it's not unusual for me to spend a day working on patent applications for a medical device, a cancer drug, and

new biofuel technology, capped off with writing an argument regarding patentability of a diagnostic assay. Being able to shed inhibitions quickly is key. When approaching new inventions, I must have the humility to question (sometimes repeatedly), "What is it? How does it work?"

Boundaries that constrain interpersonal interactions are even more limiting. How often do you see colleagues at conferences talking only with scientists in related research specialties, with analogous jobs, and even of similar age? Try this: at your next conference, find the person in the room who you think you have the least in common with. Then introduce yourself, sit down, and have a conversation. It may well be the most engaging discussion of the day.

Cross talk between industry and academic or government professionals may be particularly beneficial. Sometimes the cultural differences yawn like an impassable chasm. I recall a conversation with an academic colleague who had patented one of her inventions and was hoping to find a licensing partner. She was mystified by a question from the university technology transfer office asking for her recommendations of good potential contacts. "Aren't they already supposed to know who to talk to?" she asked. Well, yes . . . and no. In business, personal relationships are everything. Being able to shake the hand of a licensing partner,

look them in the eye, and gauge whether it will be a good fit is indispensable. There is a gut level of trust that no amount of curriculum vitae reading will replace. So when there is an existing connection between the parties, it's more likely that a licensing agreement will come to fruition.

It is also incredibly helpful for academic researchers to understand the minefield-strewn path to commercialization. Believe it or not, whether a technology makes it to market has only an indirect relationship with how well it works. Issues relating to the competitive landscape, cost and logistics of manufacturing, intellectual property, regulatory approval, and investor backing all come into play. Don't know where to begin? Read blogs or trade magazines for the biotech and ag biotech industries. Join a local business networking group. You might even consider taking a limited-term contract or internship with a company.

Everything Living Needs to Sleep, Eat, and Move—Including Scientists

An article by Morgan Giddings (<http://blog.the-scientist.com/2010/10/19/avoid-the-career-virus>) published online by *The Scientist* describes a "mind virus" summarized as, "Science is a real struggle. It's a dog-eat-dog endeavor, and if you aren't hyper-competitive, super smart, and working 80 hours a week, you won't succeed." Central to this view is that working past the point of exhaustion and ignoring one's health is somehow a badge of honor.

It's not. As you dedicate yourself to studying biology, do not neglect your *own* biology. While dedication and drive are admirable qualities, there are physical limits. Sleep and exercise are not frivolous pursuits for scientists; they are needed for clarity of thought. Ruth Berggren, a physician

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practicing in New Orleans in 2005, wrote about her harrowing experiences providing care while trapped at Charity Hospital after Hurricane Katrina (<http://www.nejm.org/doi/pdf/10.1056/NEJMp058239>). When hopes of quick rescue faded, the nurses organized into 12-hour shifts and efficiently cared for patients. She wrote, "In contrast, the doctors were terrible about sleep. Except in the emergency department, there was no delineation of shift work. After 48 hours, a dedicated and respected colleague was already displaying word-finding difficulty, and the problem continued to worsen." No one thinks clearly when exhausted, and in a laboratory, a sleep-deprived scientist can be anything from inefficient to downright dangerous.

Additionally, let's be plainspoken: don't neglect reproductive biology. For those

considering having children, I will repeat advice from a speaker (whose name, sadly, I no longer recall) at a luncheon organized by the ASPB Women in Plant Biology Committee several years ago: the biological clock is real, and it doesn't have a snooze button or an off switch. It's not wise to wait forever to have kids, even considering options such as adoption (many U.S. and international adoption agencies have an age limit for parental applicants) or assisted reproductive technology. The advice mentioned at that ASPB luncheon truly hit home, as it was still relatively rare for the topic of parenting to be discussed in such a forthright and encouraging manner within a professional scientific society. My thoughts on starting a family shifted from the nebulous "someday" realm toward the "OK, when?" realm. Some time later, my husband and I welcomed our first daughter, born during one of my postdocs.

Our youngest daughter is now a year old. They are, simply, our deepest joy.

Cultivate Wonder

Finally, always, *always* make certain that you are continuing to kindle the feeling of awe that drew you to science in the first place. Biology is resilient and fascinating, inspiring and beautifully messy. There will always be funding to pursue, experiments that fail, and workplace politics. Never let them eclipse the wonder of discovery. 

About the Author

Robyn M. Perrin, PhD, is a registered patent agent at the law firm of Casimir Jones, S.C. She lives in Madison, Wisconsin. When not drafting patents, doing freelance writing, or spending time with her family, she writes for Focal Flame Photography, a business she owns with her husband.



The Arabidopsis Book

The American Society of Plant Biologists has published *The Arabidopsis Book* (TAB) as a free online compendium since 2002. ASPB is providing funds for the production of TAB as a public service.

Founded by Chris Somerville and Elliot Meyerowitz, TAB now has more than 80 chapters online and received over 82,000 full-text downloads in 2010.

The current editorial board is working hard to continue TAB's ongoing expansion:

Rob Last (*chair*)
Michigan State University

Caren Chang
University of Maryland

Georg Jander
Boyce Thompson Institute

Dan Kliebenstein
University of California, Davis

Rob McClung
Dartmouth College

Harvey Millar
University of Western Australia

Keiko Torii
University of Washington

Doris Wagner
University of Pennsylvania

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



All chapters are hosted in partnership with BioOne (www.bioone.org) in HTML and PDF formats.

Photos courtesy of The Arabidopsis Information Resource and the RIKEN Plant Science Center.



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: Bala Rathinasabapathi

Title: Associate Professor

Place of Work or School: Horticultural Sciences Department, University of Florida

Research Area: Stress physiology and functional genomics are my areas of specialty. My program focuses on understanding how plants adapt to environmental stress. We have been studying an unusual fern species (*Pteris vittata*) that hyperaccumulates arsenic. Through this work we have discovered biotechnological strategies to engineer plants to improve their tolerance to high temperature stress.

Member since: 1990

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

The best and the brightest plant biologists are members of ASPB. ASPB has given me opportunities, especially via its annual meetings, to share scientific ideas. More than once, I have thought of ideas for experiments or projects after attending an annual meeting.

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

ASPB facilitates my interactions with other plant scientists.

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

Professional societies can help you understand contemporary scientific ideas, identify professional collaborators, gauge and shape trends in public

policy related to your discipline, and find research funding opportunities. ASPB does a great job in all these areas, and nonmembers will benefit by that.

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

Yes, I have used job advertisements and hired people using ASPB job postings.

5. 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?

Yes. I usually read them at home.

6. 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, and if so, what were they?

I think that more work needs to be done to attract and inspire bright young students to science, especially plant science. While what is being done by ASPB is great, more should be done. I have not become active in the governance of the Society but would like to be involved.

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

I think that the most important role for a scientific society is to facilitate professional networking among its members.

8. What could ASPB do better?

I cannot think of anything ASPB does not do well. However, I see that there is a glut of trained people at the early career level (postdocs) and fewer academic positions. ASPB can play more active roles in bringing the biotech industry to interact with universities, thus increasing the chances for job seekers.

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

Focus on a well-defined research problem and articulate your research well. Funding success could make or break your career success.

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

Within the past several years, crop genomes (poplar, corn, and soybean, etc.) have been sequenced, opening the door to novel possibilities to improve these species.

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

Application of the genomic sciences and technologies to understand some of the agriculturally valuable traits, such as hybrid vigor, grain yield, quality, flavor, and so on, is what I think will be the next big thing in plant biology.

12. What are you reading these days?

I have been reading a new version of an old book—*Biochemical Adaptation: Mechanism and Process in Physiological Evolution*, by Peter Hochachka and George Somero. This is a fascinating compilation of comparative physiology. Another book I have been reading now and then is *The Plant Lover’s Companion: Plants, People and Places*, by Julia Brittain. This book has interesting stories about people (both professional and amateur) who took special interest to collect and study plants.

13. What do you still have left to learn?

When it comes to learning, I am always a student. 

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The following article is reprinted with permission from HHMI Bulletin, November 2010, Vol. 23, No. 4.

Seeding Plant Science

Four years ago Joanne Chory made a bold statement within the pages of the *HHMI Bulletin* that “the study of plant genomes might contribute more to human health and well-being than the study of any animal genome.” As one of a handful of plant scientists within the HHMI [Howard Hughes Medical Institute] community, the investigator at the Salk Institute for



Robert Tjian. PHOTO BY BARBARA RIES, VIA HHMI.

Biological Studies has spent many an hour explaining to quizzical colleagues how much they could learn from the mouse ear cress (*Arabidopsis thaliana*)—as distinct from the mammalian mouse (*Mus musculus*).

Chory’s carefully cultivated seeds have now borne fruit. Earlier this fall, HHMI and the California-based Gordon and Betty Moore Foundation announced (<http://www.hhmi.org/news/plant20100930.html>) that we would hold a joint competition to identify up to 15 of this nation’s most creative and talented plant scientists (see related article in November/December 2010 *ASPB News* [<http://www.aspb.org/newsletter/novdec10/07howard.cfm>]). When selected in 2011, they will join the Institute as investigators and also receive substantial grant support from the Moore Foundation over a five-year period. We think the creation of our joint program underscores the importance of investing in fundamental plant science and will encourage others in the United States to make analogous commitments. We also believe this core group will have an outsized impact on their fields, particularly in attracting a new generation of graduate students and postdoctoral researchers.

Why now? Plant research proved its value long ago—after all, study of the humble pea helped found the modern field of genetics—but one could argue there has never

been a more important time in our history. Plant scientists have tremendous potential to help us understand—and possibly find solutions to—some of the most pressing concerns that face society: food production, human health, protection of the environment, identification of renewable energy sources. The 2009 National Research Council Report, *A New Biology for the 21st Century*

(http://www.nap.edu/catalog.php?record_id=12764), provides a much-needed framework for discussing these important issues among policy makers and academic leaders. Other positive developments are on the horizon, including a plan for developing a competitive grants program within the National Institute of Food and Agriculture, part of the U.S. Department of Agriculture.

For too long, fundamental plant science has been something of an afterthought in the U.S.—where substantial resources are dedicated to applied agricultural research—and represents about 2 percent of overall life sciences spending by the federal government. A highly respected scientist like Chory may succeed in receiving grants through the National Institutes of Health (NIH), but she is an exception. At the turn of the millennium, for example, of some 24,000 scientists working with *Arabidopsis* as their model organism, fewer than five dozen received NIH research project grants.

The interagency National Plant Genome Initiative—funded through NIH, the National Science Foundation (NSF), the departments of Agriculture and Energy, and others—has generated useful tools and

knowledge over the past decade. But the NSF, which supports many plant scientists, has had few dedicated programs in fundamental plant science. Elsewhere in this issue [reprinted on p. 22 of this issue of the *ASPB News*], Vicki L. Chandler, chief program officer for the Moore Foundation’s science initiatives and a noted plant researcher in her own right, describes the challenges and opportunities that face her colleagues in the field.

The collaboration between HHMI and the Moore Foundation illustrates the extraordinary potential for targeted investment in plant science research because our organizations would not appear, at first glance, to be obvious partners. The Moore

Foundation, which has long been committed to environmental conservation, has focused on supporting fundamental research in physical, life, and information sciences. Given HHMI’s

primary focus on biomedical research with the potential to improve human health, the Institute has historically viewed much of plant science research as outside its traditional scope. Just as the Moore Foundation sought to connect its environmental and scientific interests, HHMI began exploring potential new directions in plant science in a 2008 workshop that Chory helped organize. As a member of the Moore Foundation’s scientific advisory board, I have seen first hand that our organizations share a commitment to supporting excellent science.

The result is something that ecologists might recognize: an example of facultative symbiosis that benefits both organizations and gives the scientists we support a greater chance to survive—if not flourish.

Robert Tjian
HHMI President

“Plant scientists have tremendous potential to help us understand—and possibly find solutions to—some of the most pressing concerns that face society.”
—Robert Tjian

The following article is reprinted with permission from HHMI Bulletin, November 2010, Vol. 23, No. 4.

Plant Science Matters

Vicki Chandler's research on how plants regulate their genes may ultimately inform studies of human diseases. She's leading the Gordon and Betty Moore Foundation's partnership with the Howard Hughes Medical Institute (HHMI) to support more of this kind of fundamental plant science.

I often say that because plants don't bleed red or run, they get overlooked. Most people don't realize that plants

like corn (maize) and thale cress (*Arabidopsis thaliana*) are excellent model organisms for key areas of biomedical science. Through studies in plants, we've determined how small noncoding RNA can ratchet up or dial down genes, for instance, and how gene regulation responds differently in distinct environments.

But tight plant science funding consistently limits our ability to turn early theoretical gains into on-the-ground advances. Scientists doing absolutely core work in plant genetics, cell biology, biochemistry, and other areas have to vie for scant federal support—and, frankly, it holds us back.

That's about to change. HHMI and the Gordon and Betty Moore Foundation, which supports basic (nonmedical) research, have teamed up to kick-start fundamental plant science research with 5-year, potentially renewable grants to 15 plant scientists (see article in November/December 2010 *ASPB News* [<http://www.aspb.org/newsletter/novdec10/07howard.cfm>]). This is the first time the two organizations have collaborated, and I have high hopes for the outcome.

First, I hope the scientists who are selected are empowered to be more innovative and creative because they will have resources to work with. The funding is roughly equivalent



Vicki Chandler. PHOTO BY MELISSA KASEMAN, VIA HHMI.

to having two R01 grants from the National Institutes of Health (NIH). Five years of support is enough time to tackle higher risk yet very important questions. If that's all we did with this program—make this research possible for 15 scientists—it would be enough to impact a field and I'd sleep well at night.

But I also have a broader hope for more systemic

change. The fact that HHMI and the Moore Foundation are contributing a total of \$75 million to advance a key model system will put a spotlight on the huge research gap—and the opportunities. I hope our investment, and the research it generates, becomes a tool that federal agencies—including NIH, the National Science Foundation (NSF), the U.S. Department of Agriculture (USDA), and the Department of Energy (DOE)—can use to secure more support from Congress for fundamental plant science. We are sending a signal: plant science matters.

In my own research, I realized the relevance of plant science as a biochemistry graduate student. I was studying gene regulation at the University of California, San Francisco, in the late 1970s, working with mammalian systems. While looking for postdoc opportunities, I realized that maize is an ideal system for studying gene expression—in particular, a remarkable phenomenon in gene silencing called paramutation.

In paramutation, one parental copy (allele) of a gene silences, or turns off, the other parental copy of that gene. This silencing sticks: generations of progeny “remember” this change, dutifully expressing the gene according to the new pattern. And, this happens with no changes in the DNA sequence.

Over the course of 20 years, first at the University of Oregon and later at the University of Arizona, my lab has uncovered some of the underlying mechanisms. They involve RNA-mediated silencing, which occurs in multiple systems. We suspect similar biochemistry works in animals and humans. If so, our paramutation work may ultimately help us better understand certain diseases.

Basic plant research—even top-notch research—falls between the funding cracks. Because NIH focuses on humans and animal model systems, it has not traditionally supported plant science. USDA leans heavily toward applied science, while DOE focuses on bioenergy. At NSF, basic plant science competes with other biology fields for funds. Even at HHMI—with its track record of supporting innovative, interdisciplinary research across model systems—the number of researchers specializing in plant science can be counted on one hand.

We all want to make progress. My role leading the science program at the Gordon and Betty Moore Foundation is to identify fundamental research areas in which a foundation can make a difference. We support varied research, from marine microbiology to the largest land-based telescope. Part of our culture is to take smart risks because major leaps forward in science won't happen without them.

With HHMI, we're thrilled to strategically grow plant science. By funding top people at various career stages, we're poised to make a real—and lasting—difference. 

Interview by Kathryn Brown. Vicki Chandler is the chief program officer for the Gordon and Betty Moore Foundation's Science Program.



This column provides just a small sample of the content in the ASPB Washington Report, which is published approximately twice per month by the ASPB Public Affairs Department and includes material provided by ASPB's legislative affairs consultants, Lewis-Burke Associates, LLC. Complete issues of the ASPB Washington Report are posted on the ASPB website at <http://www.aspb.org/publicaffairs/washington.cfm>.

Funding Opportunities

ASPB is updating its website to provide information about selected funding opportunities for plant biology research and education. We are also developing a set of background documents about key public and private sponsors of plant biology research to help ASPB members access funding opportunities, learn about the review process, and provide other information about these major sponsors. Check out <http://aspb.org/researchfunding> for complete information.

ASPB Asks for Robust Support for Key Federal Funding Agencies

Over the past several months, ASPB has been active in signing on to a number of letters to members of Congress and Obama administration officials calling for robust support of key federal funding agencies. Letters have included calls for “vigorous support of basic research funding” at the National Science Foundation, increased funding for basic research at the Department of Energy’s Office of Science, highest possible levels of funding for the USDA’s Agriculture and Food Research Initiative, and robust support for the National Institutes of Health.

ASPB Members Lead Plant Genome Research Program Awards

ASPB members are helping advance our understanding of plants and their genes, efforts that in addition to furthering our fundamental knowledge of plant biology, will improve our ability to enhance agricultural productivity, grow nutritious foods, and diminish the effects of devastating plant parasites. ASPB members are leading the majority of the 28 new research awards recently announced by the National Science Foundation (NSF) under its Plant Genome Research Program (PGRP).

The PGRP, which was established in 1998 as part of the National Plant Genome Initia-

tive, is coordinated by an Interagency Working Group on Plant Genomes of the National Science and Technology Council. A total of \$101.9 million was awarded under this new announcement.

The projects supported under the PGRP awards use the techniques of modern genomics—sequencing and analyzing genetic material—to advance our understanding of how plant genes function and govern plants’ interactions with the environment in economically important crop species, including barley, corn, cotton, rice, soybean, tomato, and wheat. Each project will also incorporate outreach and educational activities, engaging K–12, community college, and undergraduate students and teachers—as well as the public—in plant-related activities. (A complete list of funded projects and their principal investigators is available in ASPB’s press release on the awards at http://my.aspb.org/resource/resmgr/Docs/2010-1104-NSF_PGRP.pdf.)

2010 Midterm Elections Will Have Implications for Congressional Leadership on Research and Education

As anticipated, Republicans took back the majority in the U.S. House of Representatives and made considerable gains in the Senate as a result of the November 2 midterm elections. Republicans picked up more than 60 seats in the House, many more than the 39 they needed to reclaim control of the chamber for the first time since 2006. In addition to defeating many Democrats elected in 2008, Republican candidates defeated several powerful long-term Democratic members, such as Armed Services Committee Chairman Ike Skelton (D-MO), Budget Committee Chairman John Spratt (D-SC), and Transportation and Infrastructure Chairman James Oberstar (D-MN).

In the Senate, Republicans significantly cut into the Democratic advantage with six

To keep up-to-date on ASPB's public affairs activities, please join the Public Affairs group (<http://my.aspb.org/members/group.asp?id=68890>) on the ASPB website and look for us on Facebook and Twitter. To receive an e-mail copy of the ASPB Washington Report, e-mail afagen@aspb.org and ask to be added to the distribution list.

seats moving into the Republican column, but were short of the 10 seats needed for a majority. Despite retaining a slim majority, Senate Democrats will be hard-pressed to garner the 60 votes necessary to overcome a filibuster of any legislation. Having experienced the difficulty of this task with a caucus of 59, expect Senate Majority Leader Harry Reid (D-NV), who himself narrowly survived a tight reelection contest, to be more selective about bringing legislation to the floor.

With many Republicans running on campaigns to reduce spending, expect the next few years to be a difficult environment for federal appropriations. Incoming Speaker of the House John Boehner (R-OH), for example, has proposed reducing federal nondefense domestic discretionary spending to fiscal year 2008 levels. This type of rollback, if implemented, would be especially difficult for agencies that have seen significant budget increases in the past few years, including the Department of Agriculture and the Department of Energy.

The change in House leadership, election defeats, and retirements will lead to some significant changes in the leadership of House and Senate committees with oversight of science agencies and federal appropriations:

- For example, former Ranking Member Rep. Ralph Hall (R-TX), who is the oldest member in the House, will chair the House Committee on Science, Space, and

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Technology. Rep. Eddie Bernice Johnson (D-TX) will be the Democratic Ranking Member. The committee's previous chair, Rep. Bart Gordon (D-TN), retired at the end of the last session.

- Sen. Debbie Stabenow (D-MI) will chair the Senate Committee on Agriculture, Nutrition, and Forestry. She is taking the place of Sen. Blanche Lincoln (D-AR), who lost her bid for reelection. Sen. Saxby Chambliss (R-GA) is expected to remain as Republican Ranking Member.

ASPB encourages members to be active in our public affairs activities, including writing letters, meeting with elected officials and their staff, hosting elected officials on their campuses, and so on. We especially encourage those from states represented by leaders of science and appropriations committees to help in our efforts on behalf of plant biologists nationwide.

Joint U.S.–Japan Metabolomics for Low Carbon Society Program Anticipated in 2011

The National Science Foundation's (NSF) Directorate for Biological Sciences, in collaboration with the Japan Science and Technology Agency, is anticipating being able to offer the Metabolomics for a Low Carbon Society Program, pending appropriation of fiscal year 2011 funds. This program will support basic research in the area of plant, algal, and microbial metabolomics; advance novel biological knowledge in metabolomics in the areas of energy and the environment; and foster greater collaborative interactions between Japanese and American scientists in these priority areas. According to a Dear Colleague letter from NSF Acting Assistant Director for Biological Sciences Joann Roskoski, the key goals of metabolomics include: (1) chemical annotation—determining the chemical structure of each molecule; (2) biological annotation—connecting each metabolite to a specific enzyme, biochemical pathway, or biological process; and (3) metabolomic annotation—the distribution

of each metabolite in different cells of an organism, which includes spatial and temporal information as well as concentration.

National Research Council Releases Assessment of Research Doctorate Programs in the United States

On September 28, the National Research Council (NRC) released the long-awaited report on research doctorate programs within the United States (<http://www.nap.edu/rdp>). The report provides an assessment based on an unprecedented data collection effort and builds on previous rankings released by the NRC in 1995 and 1982. This study expands the size of the programs surveyed and the number and complexity of questions included in the survey to faculty at research universities, as compared with previous such assessments. The data covers 5,000 programs in 62 fields at 212 universities.

The study collected data on 20 characteristics of doctorate programs, including publications per faculty member, citations, percent of faculty with grants, percent of minority and female faculty, percent of interdisciplinary faculty, percent of first-year students with external funding and those with full support, percent of minority and female students, percent of international students, average completion percentage, median time to degree, size of student workspace, student health insurance, and the number of student activities offered.

Two rankings are used for each program, one based on a faculty survey of important characteristics (S rankings) and the other on the characteristics of the most highly respected programs within a field (R rankings). Both the S and R rankings do not allow for ordinal rankings of doctorate programs, but they do allow for rankings within “ranges.”

In addition to data published by the NRC itself and publications including *The Chronicle of Higher Education* and *Inside Higher Ed*, the independent website PhDs.org provides a user-friendly interface to the NRC's data, including rankings specific to the plant sciences (<http://graduate-school.phds.org/rankings/botany>).

National Academies Releases Report on Underrepresented Minority Participation in STEM

On September 30, the National Academies released *Expanding Underrepresented Minority Participation: America's Science and Technology Talent at the Crossroads* (<http://bit.ly/e7ZTiU>), which explores the role of diversity in the science, technology, engineering, and mathematics (STEM) workforce and its value in keeping America innovative and competitive. Underrepresented minorities—including African Americans, Hispanics, and Native Americans—made up just over 9% of college-educated Americans in science and engineering occupations in 2006, only one-third of the share of minorities in the U.S. population.

To reach the goal of reflecting the diversity within the U.S. population at large, the report says higher education institutions should create programs that provide underrepresented minority students in STEM with strong financial, academic, and social support.

In addition, the report says that K–12 STEM teachers need better preparation, and high school programs should emphasize college readiness. Few students who require remedial courses beyond high school complete undergraduate degrees in STEM. Secondary school programs that guarantee access to advanced courses and proper academic advising would ensure underrepresented minorities are fully prepared for college and improve graduation rates. The report suggests that the federal government, industry, and postsecondary institutions should work collaboratively with K–12 schools and school systems to increase minority access to and demand for STEM education and technical training.

Expanding Underrepresented Minority Participation identifies best practices and offers a comprehensive road map for increasing involvement of underrepresented minorities and improving the quality of their education. A committee chaired by Freeman A. Hrabowski III, president of the University of Maryland, Baltimore County, wrote the report. 

Adam P. Fagen, PhD
ASPB Public Affairs Director



Minneapolis Is a Great Place!

ASP Paints the Town with Science Resources During NABT 2010

The 2010 National Association of Biology Teachers (NABT) Annual Conference (<http://www.nabt2010.org>) was held in Minneapolis on November 3–6, 2010, so we took the opportunity to check out the city in anticipation of the upcoming ASPB 2011 annual meeting. Not only was the location wonderful, the food and friendliness of the city really impressed us. There are a number of terrific restaurants near the convention center!

Our ASPB Education Booth was a huge success. Teachers, outreach specialists, and even other exhibitors came by to make the

garden necklaces and 5× mini microscopes, to get copies of our new CDs containing the 12 Principles inquiry-based labs (<http://www.aspb.org/education/12labs>), to pick up a selection of helpful handouts, and to learn about our organization. Booth visitors expressed the need for good materials and were enthusiastic about using plants in their teaching. They really appreciated what we had to offer.

As usual, we were aided by a group of outstanding booth volunteers. Jan Haldeman and local plant biologists actively supporting

ASPB—Anke Reinders, Mohamed Yakub, Kevin Dorn, Steve Keller, and Sue Wick—all became very adept at showing visitors how to make the necklaces and mini microscopes and describing our other materials. I was so impressed with their enthusiasm! We could not have done it without their help. 

Jane Ellis
Presbyterian College



Booth visitors are happy to make and take Lilliputian garden cup necklaces that will help them cultivate lab activities in their own classrooms.

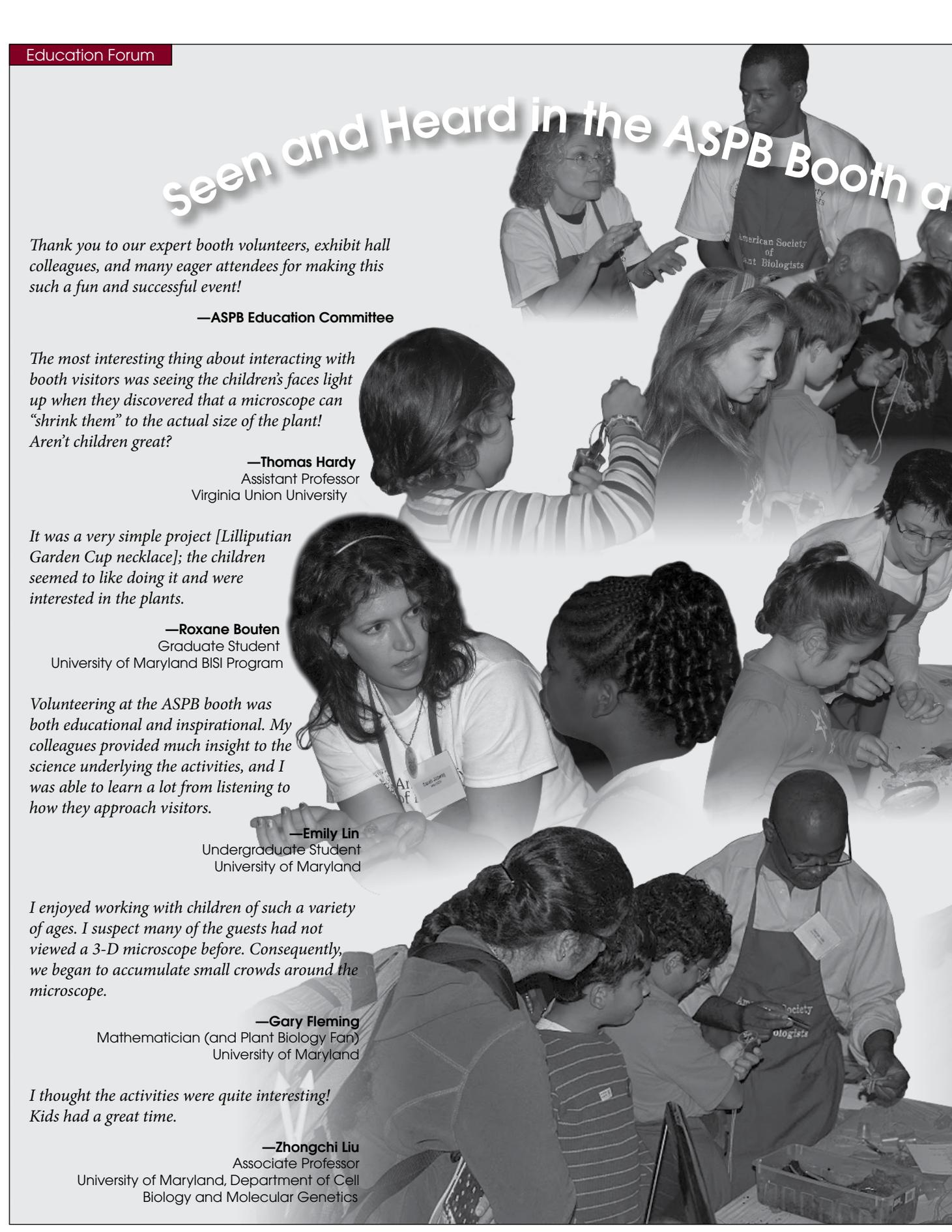


ASPB's booth was crowded with educators eager to learn about teaching biology with plants.



(left to right) Booth veteran Jan Haldeman, with ASPB member-volunteers from the Minneapolis area Mohamed Yakub and Anke Reinders, and a happy booth visitor.

Seen and Heard in the ASPB Booth at



Thank you to our expert booth volunteers, exhibit hall colleagues, and many eager attendees for making this such a fun and successful event!

—ASPB Education Committee

The most interesting thing about interacting with booth visitors was seeing the children's faces light up when they discovered that a microscope can "shrink them" to the actual size of the plant! Aren't children great?

—Thomas Hardy
Assistant Professor
Virginia Union University

It was a very simple project [Lilliputian Garden Cup necklace]; the children seemed to like doing it and were interested in the plants.

—Roxane Bouten
Graduate Student
University of Maryland BISI Program

Volunteering at the ASPB booth was both educational and inspirational. My colleagues provided much insight to the science underlying the activities, and I was able to learn a lot from listening to how they approach visitors.

—Emily Lin
Undergraduate Student
University of Maryland

I enjoyed working with children of such a variety of ages. I suspect many of the guests had not viewed a 3-D microscope before. Consequently, we began to accumulate small crowds around the microscope.

—Gary Fleming
Mathematician (and Plant Biology Fan)
University of Maryland

I thought the activities were quite interesting! Kids had a great time.

—Zhongchi Liu
Associate Professor
University of Maryland, Department of Cell
Biology and Molecular Genetics



Washington, DC, October 23-24, 2010 USA Science & Engineering Festival 2010!

*So many people came to the booth; we were constantly busy explaining, showing, and teaching. I had a blast watching the kids' and their parents' expressions when they looked in the microscope and saw the *Kalanchoe daigremontiana* plantlets forming on the edges of the mother leaf. It sure led to some interesting discussions about cloning.*

—Janet Slovin, PhD
Research Scientist
Genetic Improvement of Fruit and
Vegetables Laboratory USDA/ARS

The hands-on aspect of the garden cup activity is great!

—Bruce McClure
University of Missouri
Department of Biochemistry
Current Program Director at NSF

The most interesting thing I learned was that the youngsters know a lot about plants! Almost all knew that plants use carbon dioxide and emit oxygen. However, they were a little weak on what else plants provide (food, fiber, etc.), so it was fun to give them something new to think about.

—Anne Datko
Emeritus Professor and
Former Division Director CSREES/USDA

Food for Thought

The Western Maryland Science & Engineering Festival, an official satellite event of the USA Science & Engineering Festival, welcomed more than 400 K–12 students and their families to a morning filled with fun and educational hands-on STEM activities and demonstrations. The event was held Saturday, October 23, at Frostburg State University and the University of Maryland Center for Environmental Science’s Appalachian Laboratory in Frostburg, Maryland. Students and presenters alike faced the cool and blustery October weather to celebrate science, technology, engineering, and mathematics and to learn about career pathways in these disciplines.

The plant sciences were well represented at the event with a set of activities focused on the theme “Where Does Your Food Come From?” The youngest plant scientists were treated to a coloring table featuring plant coloring and activity sheets provided by ASPB and Max (the soybean boy) from the Maryland Soybean Board. With more than 50 activities to enjoy, this table was also a nice spot for toddlers and preschoolers to settle down for a few minutes and learn a bit about plants while creating some fantastic masterpieces.

The most popular activity of the set featured the Name That Plant game, where participants were challenged to identify common food plants (such as tomato, corn, wheat, oat, and soybean) after being given the plant itself and a few carefully crafted hints. Everyone was a winner in this game as the 12 Principles of Plant Biology bookmarks were handed out as prizes for correct answers. From this activity featuring how plants feed the world, students were ushered on to learn a bit about how plants feed themselves. This activity included a lift-a-flap poster describing basic plant structures (leaves, stems, and roots) and

(right) Kristen Lennon (center of photo) helps students plant a food plant at the Plant-a-Plant activity table. K–12 students could plant tomato, lettuce, or sunflower seeds and enjoy the fruits of their labor in a couple of months.

(below) Members of the Beta-Beta-Beta Biological Honor Society aided K–12 students with isolating plant DNA from bananas. This hands-on activity allowed the students to wear the DNA they isolated as a necklace.



the roles that they play in a plant’s ability to make its own food, as well as a collection of plants and displays that allowed participants to observe living roots and leaf types and watch plants in action through the videos



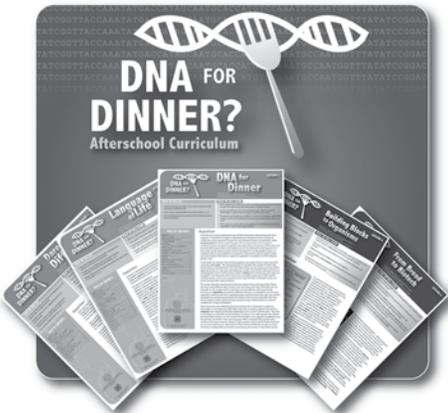
(above) ASPB member David Puthoff (center) serves as emcee of the Name That Plant game during the Western Maryland Science & Engineering Festival. Correct identification of common crop plants was rewarded with one of the 12 Principles of Plant Biology bookmarks developed by ASPB.

(left) Interest among the many K–12 students at the Western Maryland Science & Engineering Festival held at Frostburg State University grew as they planted seeds of tomato, sunflower, or lettuce. Plant-related science activities were sponsored in part by ASPB.

on the Plants-in-Motion website (<http://plantsinmotion.bio.indiana.edu>). Take-home activities, such as “How many plants does it take to make a fast food burger?” and “Plants

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It's DNA for Dinner Time!



With 2007 Education Foundation funds, we undertook what we thought would be a relatively easy task—updating a 4-H curriculum, *Biotechnology and Foods*, written in 1994. The establishment of the national 4-H Science, Engineering, and Technology (SET) initiative sparked this effort. 4-H currently reaches nearly 6 million youth in urban, suburban, and rural communities; the new SET initiative aims to involve another 1 million young people during its five-year effort—100,000 in California alone. The SET initiative encouraged the development of curricula in SET topic areas—and biotechnology curricula were noticeably absent.

After two years of intense effort—writing, updating, and revising the five lessons—we now have completed our task. It is DNA for Dinner Time! The five lessons in the curriculum, designed for fifth- through eighth-grade participants, include Dare to Be Different (organisms, genetic diversity); Language of Life (genomes, genetic code); DNA for Dinner (genes, DNA, reproduction); Building Blocks to Organisms (amino acids, proteins, enzymes); and From Bread to Biotech (classical breeding, genetic engineering, restriction enzymes). Each lesson has an introduction, open-ended discussion questions, math puzzles, and three to five activities to demonstrate key points of the lesson. Some activities are computer-based, some are hands-on, and some are physical activities.

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Educational displays, funded by ASPB, and accompanying cards in English and Spanish are available for loan.

Additional Resources from ucbiotech.org

In addition to the DNA for Dinner curriculum, Peggy Lemaux and Barbara Alonso have developed a number of other educational resources with support from the ASPB Education Foundation that focus on foods, agriculture, genetic diversity, genomics, biotechnology, and classical breeding. Two educational displays, “Foods: Past, Present, and Future” and “Genes, Genomics, and Diversity,” are available for loan via <http://ucbiotech.org/resources/display/displays.html>. Also available are companion English and Spanish baseball-type

cards (above). There is a teacher guide that provides games that can be used with the displays and cards. These resources have been widely used at county and state fairs, professional meetings of educators and scientists, Master Gardeners’ gatherings, and teacher conferences, as well as in classrooms worldwide. With 2007 funds from the ASPB Education Foundation, Peggy and Barbara created the GENE-ie Juice Bar (left), which reminds users that DNA and genes are a natural part of our lives.



The GENE-ie Juice Bar comes ready for DNA isolation (fruit not included!).



Barbara Alonso playing the genomics game with attendees.



USB drives, preloaded with PDFs of the DNA for Dinner lessons, were a big hit at the fair.



(right) The DNA for Dinner table at the science fair in Asilomar.

DNA for Dinner
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On November 6, 2010, we introduced the curriculum at the State 4-H Leaders' Forum Science Fair at the Asilomar Conference Center in Pacific Grove, California. The weekend retreat attracted volunteers of all ages, experiences, and locations who came together to find new inspiration and ideas for their clubs. One notable part of the forum was recognition of volunteers, which started with recognizing volunteers of at least 20 years (15 such individuals in attendance). They then proceeded up by

decades—30, 40, and, yes, even 50 years of 4-H volunteer work!

The evening ended in a science fair where some 12 groups showcased examples of SET

activities and curricula. Our table presented the five DNA for Dinner lessons and a hands-on genomics puzzle for volunteers to master. We distributed a USB drive that contained all five lessons and activities as PDFs, as well as a user survey. These materials are also available for download as PDFs in the resources section of <http://ucbiotech.org>. In addition, we introduced the volunteers to our other ASPB-funded educational resources, such as the displays and cards. We also described the NSF-sponsored 3-D Zombie Plague game that is currently being developed with the University of California, Davis. Quite a few attendees were interested in using all of these resources.

Volunteers were very excited about the curriculum, using it either in its entirety or as individual lessons or activities that could be meshed with other activities their 4-H groups were doing. While specifically designed for 4-H, the curriculum is also useful for other after-school and during-school venues, as it was designed to meet National Science Education Standards.

Peggy G. Lemaux and Barbara Alonso
University of California, Berkeley

Food for Thought
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around the house" from the ASPB education website, were also available.

As a grand finale to the themed set, kids of all ages visited the "Plant-a-plant, take it home, watch it grow . . . then eat it!" table, at which they decorated their own plant pot and planted a tomato, lettuce, or sunflower seed to take home. In a related activity, sponsored by Fisher Scientific, middle and high

school students isolated DNA from bananas (or from themselves) and took the As, Ts, Cs, and Gs home with them on a necklace.

None of the activities would have been possible without the generous support of ASPB, Fisher Scientific, the Maryland Soybean Board, the Allegany County Public Schools, a grant from the Frostburg State University Foundation, and the support of the Department of Biology at Frostburg State University. Volunteers who staffed the

various activities were from Beta-Beta-Beta Biological Honor Society and the Department of Biology at Frostburg State University. For more information on these activities or to have copies sent to you, please contact Kristen Lennon (kalennon@frostburg.edu) or David Puthoff (dpputhoff@frostburg.edu).

David Puthoff
Frostburg State University

ASPB Education Foundation Grants

Promoting Plant Biology Education and Outreach

The ASPB Education Foundation seeks proposals from ASPB members to support education and outreach activities that advance knowledge and appreciation of plant biology. The Foundation was established in 1995 with the main goal of enhancing public awareness and understanding of the role of plants in all areas of life. To this end, the Foundation supports education and outreach projects (i.e., NOT science research projects) that enrich and promote youth, student, and general public understanding of the

- importance of plants for the sustainable production of medicine, food, fibers, and fuels
- critical role plants play in sustaining functional ecosystems in changing environments
- latest developments in plant biotechnologies, including genetic modifications that enhance the disease and stress resistance of crops
- contributions of discoveries made in plants to discoveries that improve human health and well-being
- range of careers related to plant biology or available to plant biologists.

The types of projects that fit the Foundation's goals include but are not limited to

- development and use of instructional materials in K–12 schools, undergraduate courses, science centers and museums, after-school science clubs, and other settings
- professional development about plant biology for educators (e.g., teachers, museum educators, 4-H agents)
- professional development about education and scientific communication for plant biologists and plant biologists in training
- development and implementation of educational exhibits or displays in science museums, science centers, libraries, and other public venues
- development and dissemination of

multimedia educational resources such as radio or video pieces, websites, and animations

- development of and support for education and outreach collaborations between plant biologists and educators.

The Foundation especially seeks projects that will produce resources that can be widely shared and disseminated and programs or relationships that can be sustained over time. Proposals are encouraged from members both within and outside the United States, and projects may serve communities from any country. Proposals that leverage funds from the ASPB Education Foundation with support from other sources are encouraged, particularly for proposals that request a full \$30,000 budget.

Sources that may be helpful in preparing successful proposals include

- project summaries from previously funded projects, which are available at the Education Foundation section of the ASPB website at <http://www.aspb.org/educationfoundation>
- project managers from winning Education Foundation Grants who can advise future applicants who seek their consultation on developing winning proposals.

Apply for a Grant

Please note: The application format changed as of 2011; previous formats will not be accepted.

Proposals must be submitted to the Education Foundation by June 3, 2011. No forms are needed. Send proposals by e-mail to the Education Foundation Assistant at katie@aspb.org. Include your full name in the body of the submitted e-mail. Attach documents as PDF files or Word documents (.doc extension). Proposal reviews will begin after the closing date.

Questions? Contact katie@aspb.org.

Each eight-page grant proposal should include the following:

1. Cover Page

- project title
- project manager's name
- address, phone, e-mail, and fax
- coinvestigator name(s) and institutional affiliation(s) (if any)

2. Project Description: The project description is limited to **five pages**, including references, figures, and images. Text should be **single-spaced, 12-point font**, with at least **1-inch margins**.

The project description should be divided into six sections:

- Goals and Objectives:** For example, what is this education/outreach project trying to achieve? Why is the project important? What previous education/outreach work has been done by the investigator(s) or others that lays the groundwork for the project? In what ways do the project goals and objectives align with the goals of the ASPB Education Foundation?
- Methods and Approaches:** For example, how will the project be implemented? Who will be involved? What is the target audience(s)? What activities will take place? What is the anticipated timeline for the project? How are the proposed activities aligned with the project's goals and objectives?
- Anticipated Outcomes:** For example, what is expected to happen as a result of the project? How many participants will be involved? What should they know, appreciate, or be able to do as a result of participating in the project?
- Evaluation Plan:** For example, what evidence will be collected that will be useful for determining whether goals or objectives are achieved? How will project outcomes be documented (e.g., number of target audience members

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ASPB Grants
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reached; knowledge or skill gains; changes in interests, attitudes, or intentions)? Who will be responsible for executing the evaluation plan?

e. **Dissemination Plan:** For example, how will project products and outcomes (e.g., instructional materials, professional development materials, exhibits, evaluation results) be shared with others who may be interested in using them (e.g., conference posters or presentations, peer-reviewed publications, newsletter articles)?

f. **References:** Include citations for any books, journal articles, websites, or other resources cited in the project description.

3. Statement of Education/Outreach

Experience and Expertise: This section is limited to one page.

- The investigator(s) should describe previous education and outreach

experiences and expertise of those involved in the project.

- Statements should include, if appropriate, brief descriptions of previous education and outreach projects, including project outcomes and impacts.
 - If appropriate, relevant references that provide evidence for the qualifications of the investigator(s) should be included (e.g., URLs for the investigators' education/outreach websites, publications). (Background on the proposal itself should be contained within the project description.)
- 4. Itemized Budget:** This section is limited to one page.
- The budget limit is \$30,000, including salary, benefits, materials, equipment, travel, and other costs.
 - Each cost should be justified.

Other Guidelines

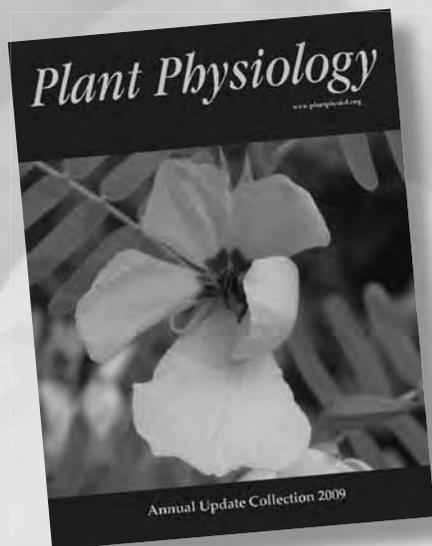
1. The project manager must be a current member of ASPB.

2. No indirect costs (overhead) will be covered by the Foundation for project awards.
3. No funds may be requested for endowments or granting programs.
4. Although projects may be implemented with a small audience for initial development and pilot testing, the Foundation expects that project products and results will impact a broader audience and generally reach beyond a single institution.
5. ASPB expects to have the right to the use of projects, materials, and results developed with grant funding.
6. Funding is awarded for a period of one year. The Foundation will consider requests for extension of time if received before the award expiration date.
7. All recipients agree to advise future applicants who seek their consultation on developing winning proposals.

Awardees will be notified by e-mail.



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.

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- Grasses
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- 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/utqiy>.

12th Annual ASPB Education Booth Competition for Innovative Instruction

Apply Now to Present at Plant Biology 2011

The Education Committee seeks to highlight new and creative techniques, technologies, or strategies developed by ASPB members for teaching and learning plant science in the laboratory, the classroom, or other venues.

Have you developed effective curricula or activities you'd like to share? The Education Committee invites you to present them at the Plant Biology 2011 Education Booth through the Plant Biology Education Booth Competition for Innovative Instruction. Exhibits emphasizing plants and sustainability in celebration of the International Year of Sustainability (2011) are welcome but not required.

Each winning project will receive one cash grant of \$500 and full conference registration costs (not including ticketed events) for up to three presenters at Plant Biology 2011 in Minneapolis, Minnesota. Winners will exhibit their materials and methods to the ASPB membership as part of the Education Booth at the conference. Awardees are expected to staff their exhibit during a predetermined schedule when the Education Booth is open.

Proposal Requirements

Include a project title. List the name(s) of presenters and their complete contact information, including e-mail. Proposals, which are limited to four double-spaced pages, must address the following:

1. State a clear rationale for the exhibit. Innovations in teaching plant-oriented sustainability topics are encouraged but not required.
2. How are the materials or strategies featured in the exhibit exciting and new? Highlight the use of innovative techniques, pedagogies, instructional materials, and/or technologies.
3. Provide a clear, detailed summary of how the exhibit will function and how visitors will interact with the exhibit. A diagram or picture would be helpful. Exhibits should take up no more than eight feet of table space. Final layout will be coordinated with Chad Jordan, the booth organizer.
4. Include a specific and complete list of equipment required for the exhibit (e.g.,

DVD player, monitor, Internet connection). Indicate what you will provide and what you would like ASPB to provide. We will make every effort to meet your needs, subject to cost and space limitations. (Please note that the list of equipment requested from ASPB cannot be changed after the proposal is submitted.)

5. Submit your exhibit proposal to Education Committee member Chad Jordan (chad_jordan@ncsu.edu) as an e-mail attachment (Microsoft Word or PDF) no later than March 11. Winners will be notified by April 15.

This is an ideal opportunity to showcase your instructional innovations for your plant science colleagues. We hope that you will consider submitting a proposal so that your work can be a part of the exciting exhibits at Plant Biology 2011!

The ASPB Education Committee

Teaching Tools IN PLANT BIOLOGY

Ideas to grow on TM



ASPB's Teaching Tools in Plant Biology Receives Gold Award

Top educational program in Association TRENDS 2010 All-Media Contest

ASPB and *The Plant Cell* are celebrating a Gold Award in the Association TRENDS 2010 All-Media Contest for **Teaching Tools in Plant Biology**, which received top honors in the educational program category.

Teaching Tools in Plant Biology is designed to make it easy for educators to use current scientific information in their classrooms. Published monthly in an online-only format by *The Plant Cell*—the top-ranked research journal in plant biology and one of the two journals published by ASPB—each Teaching Tool consists of sets of PowerPoint slides with accompanying lecture notes, designed for use by teachers of undergraduate students. Teaching Tools in Plant Biology links education and research, emphasizing that experimental data are the fundamentals upon which our scientific knowledge is based. By linking directly to research articles, these educational materials help instructors and students delve more deeply into the subject matter. The Tools can be

used off-the-shelf or easily customized by the instructor, who can pick and choose from among approximately 100 slides on a topic each month. Teaching Tools are peer reviewed by experts so that each Tool incorporates the most recent knowledge, and they are reviewed annually to ensure that the content remains current.

"Everyone at *The Plant Cell* is thrilled to have been awarded the Gold Award for Teaching Tools in Plant Biology," said Cathie Martin, editor in chief of *The Plant Cell*. "We are proud to have developed a wonderful and innovative publishing feature that brings research on plants to the classroom and provides current, peer-reviewed materials for busy educators. It is a tremendous honor to receive recognition for the quality of Teaching Tools in Plant Biology from a professional organization like Association TRENDS."

Teaching Tools in Plant Biology is developed by Mary Williams, now features editor for *The Plant Cell* following a 14-year career

as professor of biology at Harvey Mudd College. Additional information about Teaching Tools in Plant Biology can be found at <http://www.plantcell.org/teachingtools/>.

The TRENDS All-Media Contest is an annual competition held exclusively for associations, recognizing the most creative and effective communication vehicles developed in the industry over the prior year. The 2010 competition included more than 470 entries in 27 categories of association communications. *Association TRENDS* is the national newspaper for association executives and suppliers, spotlighting the latest news, information, and trends in association management for the professional staff of international, national, state, regional, and local voluntary organizations.

Teaching Tools in Plant Biology will be honored at February's 32nd Annual Salute to Association Excellence and featured in the January issue of *Association TRENDS* and online. 

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Sample throughput for <1,000 bp fragments	96 samples in 30 minutes
Samples per run	96
Resolution	5 bp, <500 bp, and 5–10 bp, >500–1,000 bp
Sensitivity	10pg/μl
Light source power	One 700mW LED, 470nm
Emission collection device	Wide angle camera
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Robotic interface capable	YES
Custom gels possible	YES
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Years of CE experience	10 years

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For quick response, e-mail us at info@aspb.org or visit our FAQ at www.aspb.org/faq.