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ASPB News



THE NEWSLETTER OF THE AMERICAN SOCIETY OF PLANT BIOLOGISTS

President's Letter

Your Society Needs Your Vote!

BY RICHARD DIXON
University of North Texas, Denton

Because of publication deadlines, I started to write this newsletter the day before the Iowa caucuses. International members of the Society may be unfamiliar with the somewhat bizarre procedure whereby the people of the state of Iowa select their preferred choices for presidential nominee for both major parties, and I would bet that many in the United States are likewise not really sure what goes on. It is lucky that voting for elected positions within ASPB is much simpler—you just have to return a ballot. But reflecting on the Iowa system did make me think about member representation within the Society and about what our manifesto is for the membership.

Politicians at election time lay out their vision for society, and the public expects them to deliver on their promises if elected. ASPB is a very different type of “society”



Rick Dixon

in that presidents serve as such for only one year. Policy within the Society is formulated and enacted by what is essentially shared governance, with ideas percolating upward from the various governance and nongovernance committees, direction provided by the Board of Directors and the Council, and implementation assisted by the chief executive officer and staff at ASPB headquarters. Many members

serve on committees, including the various nomination committees, but committee members still form only a small percentage of the total membership. Many members are also active in the regional sections of the Society. But for the Society to truly serve its members, we need them to both vote and provide ideas and feedback on how the Society is serving their needs.

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Plant Biology 2016

JULY 9–13 | AUSTIN, TEXAS

A Sneak Peek

Whether you're a graduate student or a seasoned scientist, plenty of great learning and networking opportunities await you at Plant Biology 2016, taking place July 9–13 in Austin, Texas. Here's a sneak peek at what you can expect from this year's event.

Five Major Symposia

- Small RNA Regulation of Genes and Development
- Developing Healthier Foods: Quality, Nutrition, and Molecular Gastronomy
- New Biological Insights from Large-Scale Biology
- Long-Distance and Cell-to-Cell Signaling
- Plant Specialized Metabolism

Workshops

- Bioinformatics Resources for Plant Biology Research
- Publishing in and Reviewing for *The Plant Cell*
- Writing Science: Inspire Careful Thinking and Useful Discourse
- Grantsmanship: USDA, NSF, DOE
- Relationship Building in Science Communication
- Ethics, Writing, and Social Media: Communication Pre- and Postpublication
- Funds Awarded by the New Foundation for Food and Agricultural Research
- Work–Family Policies and Gender Inequality—Luncheon Sponsored by the Women in Plant Biology Committee
- Cultivating Broader Impact Programs: Developing and Executing a Successful Program for Current and Future Grants

Minisymposia

Concurrent minisymposia, one of the highlights of the meeting for both new and seasoned scientists, focus on recent work in a topic area from several labs. Lab leaders and up-and-coming scientists will present their latest work.

The 2016 meeting will feature 30 concurrent minisymposia, and seven of them have invited organizers with topics:

- Heterosis—Jeff Chen, University of Texas, Austin
- Cellular Architecture—Erik Neilsen, University of Washington
- Hormone Biology—Tai-Ping Sun, Duke University
- High-Throughput Phenotyping—Lisa Ainsworth, University of Illinois
- Metabolic Networks—Sam Seaver, Argonne National Laboratory
- Light Biology—Winslow Briggs, Carnegie Institution for Science
- Genome Evolution—Shin-Han Shiu, Michigan State University

Poster Presentations and Exhibits

Approximately 1,100 posters will be presented, and more than 100 exhibitors will demonstrate the latest technologies and services. If you have research you'd like to share with Plant Biology 2016 attendees, consider submitting an abstract for a poster presentation. The submission deadline for poster abstracts is June 1, 2016.

Plantae Pavilion in the Exhibit Hall

The centrally located Plantae Pavilion will be the place for you to meet up with colleagues and find a steady supply of coffee, Wi-Fi, charging stations, and message boards. Just stop by, and staff will walk you through Plantae.org, a resourceful social media platform geared toward plant biologists. They'll even help you set up your own account and profile.

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Plant Biology 2016

JULY 9–13 | AUSTIN, TEXAS

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Travel Once and Benefit from Two More Great Programs

Post-transcriptional Gene Regulation in Plants (PGRP) Meeting

While you're attending Plant Biology 2016, extend your stay and continue your learning experience at the Post-transcriptional Gene Regulation in Plants (PGRP) meeting. Taking place July 14–15 at the Austin Convention Center, this meeting will consider all aspects of post-transcriptional regulation of gene expression, including RNA biogenesis, structure and function, turnover, and targeting, as well as mechanistic studies of translation and protein stability. You'll meet a diverse group of researchers from different disciplines (e.g., biology, biochemistry, computer sciences, statistics) who investigate various aspects of gene regulation at the post-transcriptional level.

PGRP is accepting abstract submissions for the meeting. To submit an abstract, visit <http://plantbiology.aspb.org/satellite-meetings>. The deadline for submissions is April 27, 2016.

Media Workshop for Scientists

After great success last year, Sense About Science USA is once again offering a media workshop for graduate students, post-doctoral fellows, and early career researchers on July 13 in the Austin Convention Center. Attendees will learn more about why it is important to communicate to a general audience about plant genetics, biotechnology, and GMOs; how journalists work on their stories; and how scientists can better cooperate with journalists to accurately spread research findings and progress. The workshop will include presentations from scientists and journalists, ample time for questions and answers, and small group discussions. The day will end with an opportunity for attendees to pitch their research to a general public. Lunch and end-of-day drinks will be provided. Space is limited, so please register at <http://plantbiology.aspb.org/> to attend.



Alice Harmon, ASPB secretary and Program Committee chair of Plant Biology 2016.

Austin Attractions

Make sure you schedule some time to take part in the local attractions of Austin. Years ago, when people talked about Austin they would quickly mention the music. But that's just the beginning of what they're saying these days. Austin is also home to a wonderful ballet, world-class museums, one-of-a-kind shopping, and beautiful outdoor spaces. You can just as easily spend your morning paddling the lake as strolling through a celebrated history museum.

There's a lot of talk about the best things to do and see in Austin. That's why there are guides for foodies, history buffs, musicians, golfers, and everyone in between. Experience Austin according to your interests, whether you're looking to experience nature or try one of nearly 2,000 food trailers in town.

For more information on Austin, visit www.austintexas.org/visit/things-to-do.

Join Conference Discussions on Plantae.org

Do you want to know the latest sessions added to the conference schedule? Do you want to find out how session topics are selected for the meeting? Do you want to chat with speakers and poster presenters before or after the conference? Do you want to get a group together for dinner while in Austin? Attendees, presenters, and conference organizers will be discussing all aspects of Plant Biology 2016 on Plantae.org. Join the discussions now. ■



In early February, the Program Committee for Plant Biology 2016 reviewed 370 abstracts for consideration to be part of a concurrent symposium.

Cultivating Evidence-Based Mentoring and Training to Enhance Diversity in STEM

BY BERONDA L. MONTGOMERY, ASPB Minority Affairs Committee Member, Michigan State University and ADÁN COLÓN-CARMONA, ASPB Minority Affairs Committee Chair, University of Massachusetts Boston

ASPB's Minority Affairs Committee (MAC) has increased its focus on evidence-based mentoring in recent years to support its long-standing efforts in broadening diversity and inclusion in the plant sciences. Effective mentoring is critical for both recruiting and retaining individuals from diverse backgrounds in science, technology, engineering, and mathematics (STEM). These efforts are fully in line with a growing national recognition that identifying and integrating such practices into ongoing efforts to diversify STEM disciplines is critical (Valantine and Collins, 2015; Whittaker and Montgomery, 2012, 2014; Whittaker et al., 2015).

ASPB and MAC Partner with the National Research Mentoring Network

In support of diversifying the workforce, ASPB is a disciplinary society partner with the National Research Mentoring Network (NRMN), funded by the National Institutes of Health (Schroeder, 2015). Current and former members of MAC were instrumental in helping obtain the funding and are participating in implementing the initiative.



NRMN is a consortium of scientific entities working to promote effective training, mentoring, and career development of diverse individuals pursuing degrees and careers at all stages in the biomedical sciences and related relevant fields, including plant biology. A core focus of NRMN aligns with MAC's focus on promoting the development of effective mentoring relationships.

To facilitate mentoring, networking, and professional development broadly, NRMN has developed an online platform, NRMNet (<https://nrmnet.net/>). Both mentees and mentors can create profiles on the website. Once a member, mentees have access to online resources and participate in virtual mentoring after being matched with a mentor based on personal

scientific interests. Mentors, too, receive benefits, including engagement in a community of mentors; opportunities to learn about best practices in mentoring; and engagement in mentoring that addresses diversity, inclusivity, and culturally relevant mentoring practices.

How Can You Participate?

All ASPB members interested in participating as mentors or mentees can create a profile at NRMNet. Please be sure to select ASPB as the referring organization from which you heard about NRMN. Additionally, NRMN is organizing and implementing regional mentor training workshops. Check NRMNet to find and participate in a training workshop near you (<https://nrmnet.net/mentor-landing-page/mentor-training/>).

Finally, at Plant Biology 2016, MAC will sponsor an NRMN panel during the annual MAC dinner. An NRMN representative will introduce resources and opportunities available to mentees and mentors through NRMN. A panel discussion will also include insights from people who have used the resources available through NRMN in their profes-

sional practice to promote the inclusion and success of diverse trainees. Looking forward to seeing you in Austin! ■

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PRESIDENT'S LETTER *continued from page 1*

Just as politicians seek votes from different demographics, who often have different and sometimes conflicting needs and aspirations, ASPB serves a broad membership in terms of both the particular subdisciplines within the field of plant biology and the career levels of its members, from graduate students to tenured professors and beyond. Because this newsletter is read primarily by people who are already members of the Society, the analogy of a political election is perhaps misleading. Nevertheless, it is important to ask, What is ASPB promising its members? What is its platform? Why is ASPB membership important, and why is voting in ASPB elections so important for the Society?

The membership will soon be asked to select a new president-elect, a secretary-elect, and corresponding members. A strong turnout of voters sends a message that the membership is engaged and cares about the direction and activities of the Society, because these newly elected officials help steer decision making within the Society, and those decisions determine what ASPB delivers to its membership.

Membership in ASPB brings much more than reduced fees for attending the Plant Biology meetings or publishing in the Society's journals. Career development is a particular concern of the Society,

and it is especially critical that the Society serves early career researchers. I was appointed to my first faculty position in 1978, with a contract until December 2016. As long as I taught my classes and published the occasional paper, I was safe. This safety net does have downsides, though, and I left the university system nine years later for a nontenured position that I felt provided greater opportunity.

I returned to a university position just three years ago. During the intervening 25 years, the pressure on scientists to teach, to publish, and, at least in universities, to be major fundraisers has increased to a level at which I may not have been competitive based on the scant training I received during my early career. I always remember a conversation with Bill Dawson, then a member of the Noble Foundation's Plant Biology Division External Advisory Board, over 20 years ago. Bill pointed out, as we were discussing metrics for promotion, that there are many areas in which a scientist needs to be competent in order to be successful, and just being smart at science will not cut it by itself. The list, as I remember it, also included being organized, having excellent interpersonal skills, being articulate and an excellent writer, being able to network with colleagues and forge collaborations, and, most important in the current granting climate, being able to bounce back from disappointments.

These qualities are even more important today. As a mentor, there is nothing more disappointing than seeing a young scientist's career fail to take off because of inadequacies beyond his or her talent for science itself. ASPB membership will provide assistance to early career scientists through access to a number of resources that address the soft skills necessary for success in the modern workplace. In fact, many of these tools will be available through the Society's newly developing digital ecosystem *Plantae*; these tools will include professional development workshops, résumé posting and review, access to a global directory of plant biologists, and ways to find others with similar interests for collaboration. *Plantae* is a work in progress, so we will be encouraging members to post suggestions for improvements and additions as the project builds momentum.

There is currently an increasing awareness that the United States is not doing enough to foster a workforce that will be able to meet the challenges of agriculture in the 21st century. For example, the National Research Council's (NRC's) Board on Agriculture and Natural Resources hosted a workshop on February 10 and 11 this year on "Building the Future Workforce for Food, Agriculture and Natural Resources," and a report from Purdue University recently identified a shortfall of some 20,000 people per year in the food and agriculture sections of academia

and industry. Clearly, there is tremendous opportunity for plant biologists in the new bio-based economy, but ensuring that they have the right training to be successful requires strong advocacy at many different levels. ASPB management, through the office of the chief executive officer and the activities of the Science Policy Committee, is deeply engaged in these conversations, and ASPB has a place at the table at meetings of the White House Office of Science and Technology Policy, various foundations and think tanks in the agriculture space, and NRC-sponsored committees and workshops to advocate for initiatives that will help provide mentorship and training for its members.

Please remember not just to vote at ASPB's upcoming elections, but also to volunteer for service on committees, avail yourself of the resources that your Society provides, and engage in discussions of not just your interests but also your needs for career advancement through the Society's social media or directly with members of the various committees. As ASPB moves forward with its new initiatives toward becoming a global one-stop shop for all things *Plantae*, we need your input and support. ■

Disseminating Quality Science and Agricultural Scientific Literacy Through Student-Organized Plant Science Symposia

BY SUNIL KUMAR KR and LEAH RUFF
University of Nebraska–Lincoln

With the ever-increasing population and changing climate, the next generation of plant scientists is challenged with providing solutions to complex food problems. Along with development of newer technologies for the advancement of science, continued success in the plant sciences can be achieved through meaningful public–private interactions and networking among scientists and students. Public–private interactions in the form of endowed professorships, research grants, and student fellowships have shown great promise in this regard.

Additionally, direct interaction between students and individuals from academia and industry has a great impact on emerging plant scientists by providing valuable learning experiences. The DuPont Plant Science Symposia series is one such initiative from the private sector to involve graduate students in facilitating student-organized plant science-themed symposia around the globe.

Initiation and Past Symposia

The initiative of DuPont Pioneer first took off at the University of Minnesota in 2008. Through joint initiative, the goal of the symposia was to enhance agricultural scientific literacy, stimulate collaboration, and help build interest in

plant breeding careers. So far, 50 events organized at 16 universities around the world have reached more than 8,000 participants in seven countries spanning five continents (see map on page 8) and will reach more researchers and the public in the years to come.

Student members of the scientific societies involved in organizing each symposium commit to improving science literacy by reaching out to the public at large. Events are marketed through social media (e.g., Facebook, LinkedIn, Twitter), free symposium registration, free webinar streaming and archiving, and publicity in local and national newspapers.

Students also educate the public about science by presenting their research through oral presentations and poster sessions, which also give students the chance to share their research with fellow researchers and to gain valuable suggestions and feedback while creating an environment for learning, collaboration, and discussion. Cash prizes are awarded to selected posters and student speakers in these symposia, and students gain valuable experience in presenting their research to symposium attendees. The exercise of explaining and advocating for one's work is critical for developing communication skills that have an impact on the public.



Members of the 2016 University of Nebraska–Lincoln Plant Breeding Symposium committee: Srikanth Kodati, Sunil Kumar KR (chair), Samantha McConaughy, Leah Ruff, Ravi Mural, Waseem Madni, Mon-Ray Shao, and Dr. David Hyten (faculty mentor).

Beyond practicing scientific communication to a lay audience, graduate students take part in the process of organizing the seminars, including budgeting, selecting speakers, arranging for their travel and accommodations, preparing the program, and managing registered participants. Student organizers work with a fixed budget provided by DuPont Pioneer with additional funding from their home departments to meet the costs of the symposium. Participation in organizing the symposium offers students the opportunity to develop professionalism and competence. Involvement encourages profes-

sional development and also offers many opportunities for informal learning such as team leadership and money management. The organizers try to encourage attendees to participate across the series through webinars, meetings about the series, and attendance at other universities' symposia.

Symposia at Participating Universities in 2016

With guidance from Dr. Tabare Abadie, senior research manager for DuPont Pioneer, participating universities are conducting plant breeding symposia in the spring of 2016. North Carolina State

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DISSEMINATING SCIENCE *continued from page 7*

University held its third biennial symposium, “Looking to the Future: Integrating Insights and Innovations in Plant Breeding,” on February 4, and Texas A&M sponsored “Healthier Food for a Healthier World” on February 18. Other symposia in the spring of 2016 include

- “Thinking Outside the Yield Box” at Iowa State University, March 3
- “Breeding for the Emerging Global Middle Class” at Cornell University, March 11
- “Exploiting and Enhancing Genetic Variation” at the University of Nebraska–Lincoln, March 29
- “Plant Breeding: Rooted in Education” at the University of Minnesota, April 8
- “Breeding for Stress Resilience” at the University of California, Davis, April 18
- “Gene Editing” at the University of California, Berkeley, May 5

Later in 2016, events will be held at the University of Wisconsin–Madison and the University of Illinois at Urbana–Champaign as well as in Brazil, South Africa, China, India, and Mexico. Dr. Abadie is in contact with other universities, including Purdue and the Universities of Georgia, Michigan, and Missouri, to integrate them into the ever-expanding symposium series.

The third biennial Plant Breeding Symposium at the

University of Nebraska–Lincoln (UNL), to be held March 29, 2016, is being organized by graduate students from the Department of Agronomy and Horticulture, along with Dr. David Hyten, faculty mentor. The 2014 UNL Plant Breeding Symposium attracted 135 registered participants and 100 online viewers and encompassed a wide range of topics from traditional soybean, apple, and tobacco breeding to genomewide selection, quantitative genetics, and practical application of technology in commercial corn breeding.

The theme of this year’s symposium, “Exploiting and Enhancing Genetic Variation: Addressing Future Challenges in Plant Breeding,” focuses on how recent developments in technology, molecular biology, genetics, and epigenetics can be

used to improve plant breeding efforts as the urgency to raise crop productivity increases in the face of climate change. The day’s agenda includes presentations from professionals in academia and industry, student research presentations, and a student research poster contest. Invited speakers include Jim Holland, USDA–ARS North Carolina State University; Jesse Poland, Kansas State University; Timothy Close, University of California, Riverside; Sally Mackenzie, University of Nebraska–Lincoln; Isabelle Henry, University of California, Davis; and Wendy Srnica, DuPont Pioneer. The science-based forum will also highlight students selected through a universitywide abstract contest and a poster session contest with cash prizes for the top three winners.

We encourage students interested in presenting their research to submit their abstract to compete for the presentation and poster contest. Presentations will be recorded and archived in our website for later viewing. The event will end with a social hour to give participants the opportunity to interact with speakers and researchers from industry. The symposium is free with catered lunch, open to the public, and offered via webinar to the broader scientific community around the world. Check out #UNLPB16 and #PopAgriculture to follow highlights of the day. To learn more about our event and to register, please visit our website at <http://agronomy.unl.edu/pbsymposium>. ■



World map depicting universities that participated in the Plant Sciences Symposia series during 2015–2016.

Welcome to the *ASPB News* “Luminaries” column. Student and postdoc members are invited to submit their ideas for a 500- to 750-word interview they might like to conduct with a prominent scientist. Contact Membership Committee Chair Jill Deikman at jill.deikman@monsanto.com, who will help you develop some questions to frame your story. If we publish your interview, you will receive a \$50 Amazon gift card.

Philip J. White

Professor, James Hutton Institute, Dundee, United Kingdom

BY MICHAEL OSEI ADU

ASPB Student Member, University of Nottingham and James Hutton Institute

You graduated with a BA in biochemistry from Oxford University and a PhD in botany from Manchester University. Was there any special reason for the shift to plant sciences?

I think perhaps it was for the same reason that some people are vegetarians. There were many practical classes in the biochemistry course at Oxford University in the early 1980s that included the dissection of animals. I didn't enjoy these. Because similar phenomena could be studied in plants, and the same concepts and principles applied, I decided to turn my attention to plants.

Could you tell us about your PhD dissertation and whether your post-PhD research interests followed on from your dissertation?

I have been lucky to work on the mineral nutrition of higher plants for over 30 years. My PhD described the effects of temperature on many aspects of plant physiology, from membrane composition and transport processes to plant development and the accumulation of mineral elements, and I published seven papers from it.



Philip J. White

My PhD was actually the second phase in a long enchantment with membrane transport processes and the mineral nutrition of plants, which began with casual jobs during the summer vacations of my undergraduate degree with Brian Loughman at the Department of Agricultural and Forest Sciences at the University of Oxford. In my postdoctoral appointments at the Universities of Edinburgh and Cambridge, I used the same biochemical techniques I had learned during my PhD studies and applied the same conceptual frameworks to analyze the data. I

have had only one real job since then, and it has always focused on the mineral nutrition of plants.

How influential were your PhD supervisors in the direction of your PhD research, and from your experience, how much influence do you think supervisors should have in the study direction of their PhD students?

If I recall correctly, and I am getting increasingly forgetful, my PhD supervisors (Mike Earnshaw of the Victoria University of Manchester and David Clarkson of the Agricultural Research Council Letcombe Laboratory) had written a short outline of my PhD project, which I was given and then left to get on with it. The facilities of Letcombe Laboratory were marvelous, the students and staff were brilliant, and I had access to all of them. David Clarkson lent me his first edition of *Bioenergetics* by David Nicholls (London: Academic Press, 1982), and Mike Earnshaw gave me his copy of *A New Look at Mechanisms in Bioenergetics* by Efraim Racker (New York: Academic Press, 1976) to guide me.

My supervisors were always there with encouragement throughout my PhD. Sometimes they scolded me, but they rarely directed me. I think, if at all possible, that that is how it should be. Incidentally, I recall a quote from Efraim Racker: “Rejoice when other scientists do not believe what you know to be true. It will give you extra time to work on it in peace. When they start claiming that they have discovered it before you, look for a new project.” I consider this to be good advice to a young scientist.

PhD in the United Kingdom is mainly by thesis, but in other places in Europe, it is by publication; what is your view on this? Do you think one has more strengths than the other?

In my opinion, they both demonstrate academic accomplishment. It is a comparison of traditional and contemporary; stylistically, it is like comparing a novel and a book of short stories. They each have their place.

You have supervised many PhD students and postdocs in your

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career. What qualities do you look for in a PhD or postdoc applicant or student?

I have successfully supervised more than 20 PhD students. In my PhD students, I look for true enthusiasm and an ability to read and learn quickly, never to make the same mistake twice, to take “advice,” and to be able to write. Eventually, I would like them to think for themselves, both logically and creatively. I have mentored many staff and young researchers, and I look for the same qualities in them. Surprisingly, I have not supervised many postdocs, perhaps fewer than half a dozen during my career. I would expect a postdoctoral scientist to act independently, as befits a collaborator. I prefer my laboratory to be more like a jazz club than a concert hall.

What advice would you give to your PhD students who are about to graduate, and what do you think an early career scientist needs to do to be noticed early in his or her field?

If they would like to continue in academia, I would advise them to submit proposals for fellowships on ideas they would like to pursue with influential scientists with whom they would like to work. I would encourage them to collaborate widely and wisely, to publish research papers and reviews, to help organize topical workshops and international conferences, and to present their work at these.

You have worked in both university settings and research institutes. Would you advise an early career scientist to work in a

university or a research institute or industry?

Everyone is different and must choose the path for themselves, depending on their character, their gifts, their ambitions, and their purpose. Intriguingly, I once read (in the HMSO bookshop on a rainy Manchester afternoon) that although most postgraduate students who want to become academics do not become academics, those who “fail” to become academics are, in the main, happiest.

What main research project are you currently engaged in, and what is the motivation behind it?

All my current research addresses the Food and Agriculture Organization’s definition of food security, which “exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life” (<http://www.fao.org/docrep/003/w3613e/w3613e00.htm>). Thus, I am developing agronomic and genetic strategies to optimize the use of water and mineral fertilizers in crop production, to reduce the entry of harmful elements into the food chain, and to improve the nutritional quality of crops through their biofortification with mineral elements essential to human and animal well-being.

You collaborate closely with a number of academics in the United Kingdom and abroad. What do you look for in a potential collaborator?

I require my collaborators to collaborate and not compete, to be honest, to keep to any agreements whether spoken or written,

to give credit where credit is due, and to tolerate my idiosyncrasies.

You were a program leader in the Specialty Crop Research Initiative (SCRI). How did you balance your administrative duties with your research? And do you think it is good for research scientists to take up more administrative roles?

As a program leader at SCRI, I managed more than 40 permanent staff plus associated visitors and students. Although it took up nearly half my workweek, managing was easy: I managed a group of exceptional, hardworking, honest, gifted, unselfish, and optimistic colleagues, who not only were excellent and innovative scientists but also published well, engaged wholly in the public understanding of science, and generated sufficient income to support their research. I believe I learned far more about science by managing the program than I would have simply by focusing on my own research. One might say that I was lucky to manage such people, at a time of relative stability, under a CEO (Peter Gregory) whom I respected. I enjoyed the job and think I gained a lot from it. Of course, I was also able to maintain my own research, which helped me through moments of suffocating bureaucracy. I would recommend the experience to even the most research-focused academic.

You have served on the editorial board of many journals and have been a reviewer for many years. What is your perspective on the rising trend of open access journals?

I agree wholeheartedly with John Raven, who wrote, “I am in favor

of open access publishing, but I also enjoy being able to publish without needing a coauthor with a research grant!” (*ASPB News*, May–June 2013, p. 18). At first, I thought open access was a wonderful idea: it would allow everyone access to the scientific literature. But now I have my doubts. Electronic publishing seems to be plagued with unethical practices. Even e-journals from respected publishers appear to be operating using dubious practices, such as “pyramid selling,” in which someone is appointed senior editor to recruit 10 editors, to each recruit 10 more specialist editors, who are each asked to produce a special issue with 10 to 20 papers in their specialty. Then, BANG! the journal could have more than 1,000 papers to publish, and if the authors of every paper are billed \$500 for their efforts, then this is half a million dollars for the journal’s coffers. I think learned societies should take an active role in promoting ethical open access publishing, supporting the publication of works from their membership, and policing the academic literature.

In your opinion, what has been the greatest scientific breakthrough in the plant sciences in the past three decades of your career?

There have been many breakthroughs—for example,

- the improvement of the polymerase chain reaction technique by Kary Mullis, who won a Nobel Prize in 1983 for this, which effectively enabled almost all molecular biology, gene and genome sequencing, and synthetic biology

- the development of techniques for the creation of transgenic plants, pioneered for example by Marc Van Montagu and Jeff Schell, which enabled us to investigate gene functions in vivo and develop GM crops
- the development of RNA-mediated gene silencing technologies by Sir David Baulcombe, which has enabled, among other things, the possibility of creating virus-resistant crop plants.

But I have the greatest admiration for Ismail Cakmak, who identified zinc deficiency as a limiting factor in crop production and human health in Anatolia, Turkey. He demonstrated that simply adding zinc to commercial fertilizers could increase wheat yields, deliver more zinc to human diets through bread products, improve people's health, and increase gross domestic product. It is said that the \$1 million investment from NATO now generates over \$100

million per year in increased crop yields, and I believe that the improvement in human health has produced far greater benefits. It is estimated that zinc deficiency might afflict over one-third of the world's population, so this simple, cost-effective strategy for zinc biofortification of edible crops is now being adopted in many countries across the world.

Currently, plant science research is arguably trending toward molecular biology and many forms of *omics*. In your view, will the traditional plant physiologist and agronomist potentially become obsolete or redundant?

I sincerely hope that traditional plant physiologists and agronomists will never be considered obsolete or redundant. I believe that their intuition and practical skills are required to put basic research into an organismal context and to translate basic

research into practical benefit. However, as Julian Schroeder stated in a previous interview in this series, "It's a clear advantage presently for biologists to be able to work with, generate, and/or navigate "big data" (*ASPB News*, November–December 2013, p. 20). But I ask you, would you replace general practitioners of medicine with laboratory biochemists, computational biologists, and abstract computer programs?"

You have been a visiting professor and delivered seminars and workshops in many countries, including my own, Ghana. What factors do you think are currently constraining research advancements in developing countries?

That's an interesting question and expresses an interesting opinion. I believe that many of the countries I work with, countries like China and Brazil, are making significant research advancements. My

subject, the mineral nutrition of plants, is relatively mature, and for the most part, these are practical rather than conceptual advances. Food security is an integral part of the development plans for these countries, which perhaps explains why, for example, 30% of the research funding in China goes to plant science versus less than 1% in the United States. Of course, scientific advancement requires adequate infrastructures and funding, but these limit research activities everywhere. Developing countries have many challenges to overcome to achieve food security, and I concur with policies to support research to obtain practical solutions to these challenges. As my grandmother once said, "You must be able to land before you can fly." ■

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Policy Update

BY LAUREN BROCCOLI
Lewis-Burke Associates, LLC

White House Renews Commitment to Agriculture Research and Education

On January 13, the White House Office of Science and Technology Policy (OSTP) called for a new commitment to research and education in food and agriculture from all sectors. The call is in response to the rapidly growing world population and subsequent demand for food. This demand, compounded by environmental issues such as soil loss and water scarcity, will require a robust pipeline of students in the STEM disciplines to choose to enter the agricultural workforce. Over the next few weeks, OSTP plans to highlight progress made to date and new commitments to research and education in food and agriculture. Examples of commitments called for in the OSTP statement include

- “support for graduate or post-doctoral fellowships or for

endowed positions to expand and strengthen integrated food-systems research, plant-breeding training programs, and the study of animal sciences.

- “partnerships between companies and professional societies that create effective pathways for research and education in food and agriculture by, for example, supporting internships, fellowships, and grants.
- “programs that recruit from populations presently underrepresented in agricultural research and education.
- “research courses in colleges and universities that introduce first- and second-year students to agricultural disciplines, and help students recognize these disciplines as modern, remunerative, scientific, and technology-driven.

- “new training programs to help primary- and secondary-school teachers of all disciplines integrate agricultural topics into their teaching and to familiarize teachers with career opportunities in food and agriculture so that they can provide sound advice to students.”

Institutions were invited to submit a new commitment or input by February 1, 2016.

Source and Additional Information

- The statement is available at <http://tinyurl.com/hubfvvrz>.

NSF Releases Statement on Grantee Compliance with Title IX

On January 25, NSF issued a statement reiterating its commitment to a discrimination-free scientific community and intolerance for Title IX violations among grantee institutions. The statement urged NSF-funded

researchers and students to report any harassment to the appropriate office at their home institutions. NSF will work with the Departments of Education and Justice to ensure compliance with Title IX among its grantees and grantee institutions. NSF may choose to “terminate funding to any institution found to be in noncompliance with Title IX regulations and that does not voluntarily come into compliance.”

Source and Additional Information

- The statement is available at <http://tinyurl.com/hmhv2e>. ■

CORRECTION

In the third sentence of the second bullet of the first column of the “Policy Update” on page 12 of the January/February 2016 issue of the *ASPB News*, “BER’s largest funding increase...” should read “DOE Office of Science’s largest funding increase...” We apologize for this error and have corrected the online version.

President Releases Fiscal Year 2017 Budget Request

BY LAUREN BROCCOLI
Lewis-Burke Associates, LLC

President Obama released the last budget request of his administration on February 9. The budget proposal nominally adheres to the top defense and nondefense discretionary spending levels agreed to by Congress in fall 2015. However, the White House is relying on mandatory spending, which requires Congress to pass legislation to make these expenditures outside of the yearly appropriations process, to fund additional priorities in a flat budget environment. Although the new initiatives and policy priorities provide the research and education communities with a rallying point for advocacy, this mandatory funding will almost certainly not be embraced, because Congress would have to enact new taxes and designate the revenue specifically for the purposes of funding these programs.

Proposed agency funding levels of interest to ASPB include the following:

- USDA's National Institute of Food and Agriculture (NIFA) would receive a total of about \$1.4 billion, an increase of 3.6 percent over the fiscal year 2016 level for discretionary programs. NIFA's Agriculture and Food Research Initiative (AFRI) would receive a combination of mandatory and discretionary funding, which in total would fund the program at its fully authorized level of \$700 million. The discretionary total for AFRI would be \$375 million, a \$25 million increase, directed to sustainable bioenergy research. The budget request seeks \$325 million in mandatory spending for the program. For ARS, the request proposes to cut discretionary programs by approximately \$100 million, although research programs would receive a slight increase of about 2 percent above the FY2016 level.
- NSF would receive \$7.964 billion, an increase of \$500.5 million or 6.7 percent over the FY2016 enacted level. Of this increase, \$400 million would be new mandatory funding. For discretionary funding, NSF would be funded at \$7.564 billion, or \$100.5 million or 1.3 percent above FY2016.
- NIH would be funded at \$33.1 billion, a \$1 billion (3.1 percent) increase over the FY2016 enacted level. Using a tactic similar to that used for other agencies, the administration is proposing that \$1.8 billion of the total NIH budget be in new mandatory funding directed to White House priorities, such as the vice president's Cancer Moonshot Initiative and precision medicine. This leaves \$31.3 billion in discretionary funding for NIH, which is less than the \$32.1 billion provided for NIH in FY2016.
- The DOE Office of Science's request is \$5.7 billion, a proposed increase of 4.2 percent. Of the six major Office of Science programs, all would receive funding increases except fusion energy sciences. Basic Energy Sciences would receive \$1.9 billion, a 4.7 percent increase above FY2016 enacted levels, whereas Biological and Environmental Research would receive \$661.9 million, an 8.7 percent increase above FY2016.

Source and Additional Information

- The president's FY2017 budget request overview is available at <http://tinyurl.com/zfbljmb>; more detailed information is available at individual agency websites. ■



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Pursuing a Unifying Message in Support of Increased Federal Investment in Ag Research

BY TYRONE SPADY

Legislative and Public Affairs Director, ASPB

A changing climate, diminishing natural resources, a growing population, and stagnating federal investments in agricultural research have created a perfect storm. Despite calls from ASPB and other scientific societies and reports from the President's Council of Advisors on Science and Technology and the National Academies urging the ramp-up of investments in agricultural research, Congress has taken only small, though still notable, steps toward addressing this issue.

To build a historic coalition across the ag research and development enterprise, the Riley Memorial Foundation (<http://rileymemorial.org/>) and its partners have launched the Pursuing a Unifying Message initiative. As its name implies, the initiative seeks to unite academic researchers, scientific societies, universities, university associations, government leaders, commodity groups, industry, and others “to work together on a common message

and toward a common goal at a time when global challenges require additional investment in agricultural research.” The need to build a common message is salient because the ag research community has traditionally been fractious, particularly compared with the National Institutes of Health community, which has enjoyed much more rapid and robust increases in investment.

Crispin Taylor, chief executive officer of ASPB, along with Bob Easter, emeritus president of the University of Illinois, led a steering committee to organize a roundtable discussion of scientific society representatives to discuss the pursuit of a unifying message in support of ag research. Several months prior, university associations were convened for a similar discussion (<http://tinyurl.com/j8v9oag>). The scientific society event took place on December 9, 2014, at AAAS headquarters in Washington, DC. Participants from 23 scientific societies joined in the roundtable, and an additional 26

individuals, such as representatives from the White House and USDA, were present as observers.

During the roundtable, participants provided input on the following points: awareness of and support for the Pursuing a Unifying Message effort; a process for developing, communicating, and sustaining a unifying message; and elements of a unifying message considered to be important by scientific societies. Feedback from participants was generated regarding agency advocacy targets, target audiences, elements of a communications strategy, and components of a potential unifying message.

So what did the roundtable participants identify as the critical elements of a unifying message? First, the message needs to embrace an inclusive definition of agriculture, one that includes production processes from raw materials to the consumer and addresses issues of sustainability and human health. Second, the theme of the interconnectedness

of the agricultural production system concerning ecosystems, crops, livestock, industry, government, and consumers is vital. Third, the message needs to focus on the public good and communicate the impacts of agriculture on society as more than just business or academic challenges. And lastly, the message needs to emphasize the long-term challenges of improving sustainability and our health and well-being.

The Riley Memorial Foundation plans to convene a third stakeholder roundtable around the theme of human health and nutrition. The foundation plans to generate the final Pursuing a Unifying Message report in 2017 to coincide with the start of the next presidential administration. ■

Thinking and Learning About Thinking and Learning

Education Events at Plant Biology 2016

BY KATIE ENGEN

ASPB Education Coordinator

Do you like thinking about how students think about plant science? Do you enjoy learning about methods for effective student learning? Is it critical to you to help students develop critical thinking and science writing skills? Then check out the education-related program options at Plant Biology 2016. Each is designed to help you pursue your goals in plant science education and related scholarship.

Writing Science: Inspire Careful Thinking and Useful Discourse

Sunday, July 10

11:30 a.m.–1:00 p.m.

Concise science writing is a cross-cutting skill necessary for success in a wide variety of science-based careers. In this workshop organized by Education Committee chair Sarah Wyatt, participants will explore writing options useful for teaching in undergraduate settings with both small and large enrollment. Featured guests:

- Wiki Edu—Use of article critiques and evaluation to mentor effective thinkers and writers
- *CourseSource*—Publication of your professional discipline-based education scholarship
- *Science in the Classroom*—Use of *Science* magazine as a teaching tool or publication option.

Bring your laptop or similar device; you will be online and writing.

Education Minisymposium

Curated by Education Committee members Erin Friedman (Lynchburg College) and Ken Helm (Siena College), this event features several models for effective teaching and learning in plant science. See the Plant Biology 2016 schedule at <http://bit.ly/1R3VDeF> for time and location.

Gloria Muday

Peer teaching as a method for improving students' understanding of and attitude toward GMO technology

Valerie Haywood

Connect the dots: Using concept maps to overcome students' misconceptions about photosynthesis

Tara Phelps-Durr

Helping students understand how DNA mutations cause a phenotype by incorporating computational molecular modeling into the classroom

Ursulla Idleman

Bridging the gap between two- and four-year colleges: A bioinformatics learning pipeline for nontraditional students

Alice Harmon

Transforming a large lecture class: Learning Assistants Program in biology at the University of Florida

Education and Outreach Booth

In this exhibit you can review resources, network with like-minded experts, and talk with Education Committee members and invited guests about a variety of carefully selected programs including

- *CourseSource*—Evidence-based teaching resources for undergraduate biology
- Council for Undergraduate Research
- Fast Plants self-compatible for genetics education
- *Science in the Classroom*
- Funding
 - ASPB Master Educator Program
 - Plant Biology Learning Objectives, Outreach Materials, & Education (Plant BLOOME) grant
 - PlantingScience—Digging Deeper
 - Promoting Active Learning and Mentoring fellowship
- Outreach opportunities
- Teaching Tools in Plant Biology
- Wiki Edu. ■

What's on Your Wiki Playlist?

Wiki Education Foundation has declared 2016 the Wikipedia Year of Science. And because ASPB is partnering with Wiki Edu, you are invited to help celebrate the Year of Science by sharing your playlist: three to five articles on the plant biology topics you're most passionate, curious, or excited about.

See ASPB's playlist: <http://bit.ly/1p9BfST>

Now it's your turn:

- Visit <http://playlist.wiki/>.
- Log in to your Twitter, Facebook, or Wikipedia account.
- Follow the intuitive interface to create your playlist.

AAAS Family Science Days 2016

Everyone “Hearts” Plant Biology on Valentine’s Day Weekend

BY KATIE ENGEN
 ASPB Education Coordinator

On February 13–14, more than 3,000 kids, teens, and adults explored science at this free-to-the-public event hosted by AAAS in Washington, DC. Here’s a closer look at visitors enjoying the ASPB exhibit.



It was a fun day. It makes science fun. We all learned so much. I think we’ll come back tomorrow!

—Three moms discussing Family Science Day after visiting the ASPB booth with their kids

ALL PHOTOS BY RACHEL BINDER.



Thank You to ASPB Volunteers!

ASPB is considered a model in the public engagement with science arena, in no small part thanks to the professionals who volunteered their time and considerable expertise at Family Science Day 2016, including Chad Jordan (North Carolina State University), Scott Woody (University of Wisconsin), Tim Woody (University of Wisconsin undergraduate research assistant), and Melanie Binder (ASPB staff). Also critical to our success were two students already quite savvy about science engagement, Rachel Binder and Ryan Binder. ■

Plant BLOOME 2016

ASPB Plant Biology Learning Objectives, Outreach Materials, & Education Grant

Application deadline: April 22, 2016 (11:59 p.m. ET)

<http://bloome.aspb.org>

Maximum funding: \$50,000

2015 average award size: \$35,550 (not all grantees requested maximum funding)

Program Summary: In 1995 ASPB established this grant program (the name changed over time) with the goal to enhance public awareness and understanding of the essential roles of plants in all areas of life.

Plant BLOOME 2016 is open to ASPB members with education and outreach projects that advance youth, student, and general public knowledge and appreciation of plant biology. These projects should strive to promote and explain varying facets of the following:

- 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 improve the quality and disease and stress resistance of crops
- discoveries made in plants that have led to improved human health and well-being
- range of careers related to plant biology or available to plant biologists.

Parameters for Proposals: Plant BLOOME does NOT support lab or field plant science research projects. Priority will be given to education and outreach projects with goals that include, but are not limited to, the development, implementation, wide dissemination, and evaluation of

- innovative instructional materials or strategies in K–12 or undergraduate settings, science centers and museums, after-school science clubs, etc.
- professional development about plant biology for educators (e.g., teachers, museum educators, 4-H agents)
- professional development about education and outreach for plant biologists and plant biologists in training
- educational exhibits or displays in science museums, science centers, libraries, and other public venues
- multimedia educational resources such as radio or video pieces, websites, apps for electronic devices, and animations
- education and outreach collaborations between plant biologists and educators.

Suggested Standards: Successful projects will align with current effective scientific teaching practices such as Vision and Change recommendations, Core Concepts and Learning Objectives for Plant Biology, 12 Principles of Plant Biology, or Next Generation Science Standards.

Basic Funding Logistics: A maximum award size of \$50,000 can be requested for the one-year funding cycle. Projects can begin any time after recipients are notified. Funds are released by mid-August and should be spent by the anniversary date, September 2, 2017. In special cases a no-cost extension may be approved (request deadline August 1, 2017).

Request for Proposal (RFP) Overview: Below is a summary of key elements. Download the full RFP (<http://bit.ly/1RCb0ev>) for complete application requirements and guidelines.

The grant proposal is limited to 8 pages total:

- introduction (1 page)
- project description (5 pages), including goals and measurable objectives, methods and approaches, anticipated outcomes, evaluation plan, dissemination plan, sustainability, and references.
- principal investigator's statement of education and outreach experience and expertise (1 page)
- itemized budget (1 page).

Read the complete RFP for all required proposal elements and related guidelines: bit.ly/1QbGg7H

Deadline: Proposals must be submitted to <http://bloome.aspb.org> by 11:59 p.m. ET April 22, 2016.

Questions? Contact Katie Engen (katie@aspb.org).



PALM Network Grant

www.ascb.org/PALM

up to \$2,000 per fellow / \$500 mentor stipend
\$1,000 meeting travel each for fellow and mentor

Application Deadline: June 15, 2016

Networking Works

The PALM Network, founded by the American Society for Cell Biology, American Society of Plant Biologists, and Genetics Society of America, combines the shared educational interests of scientific organizations working for the Vision and Change initiative. We will continue to add new network members, bringing in other organizations working hard to promote the principles of Vision and Change and seeking collaborations based on reform efforts. The PALM Steering Committee's links to minority- and tribal-serving institutions and community colleges will support this grant's goals for **broadening participation** in active learning reform. These organizations educate over half the underrepresented minorities in the United States, so PALM is primed to bring Vision and Change reforms to populations of faculty and students who have not factored prominently into past educational reform plans.

PALM fellows will

- Identify and secure partnership with experienced mentors who have already reformed their classrooms
- Submit a complete proposal
- Schedule dates to complete the identified work within 6 months of receiving the award notification
- Develop an active learning-based module for one of their classes with guidance from their mentors, and implement it
- Submit videos of their teaching before and after their mentoring experience for analysis
- Consider best options and timing for disseminating their materials to others in their institutions and in the greater scientific community, including publication (e.g., *CourseSource*)
- Report on their activities to colleagues at the year-end gathering of the PALM Network, as well as at a national, regional, or sectional meeting of their respective scientific societies
- Participate in surveys over several years so the PALM Network can assess the extent and persistence of change in classroom practice.



More information is available at www.ascb.org/PALM.

This award is biannual; **deadlines are the 15th of January and June.**



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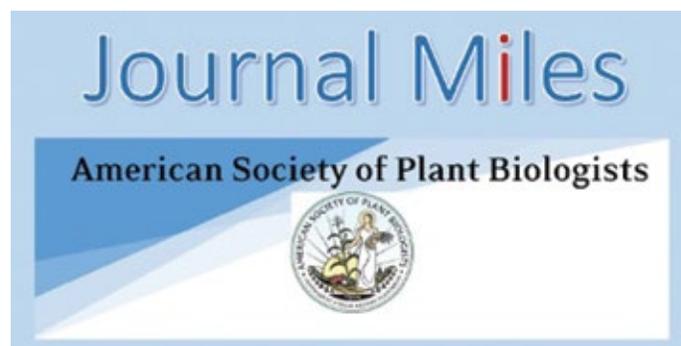
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