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Say Aloha to Plant Biology 2017!
June 24–28
Honolulu, Hawaii



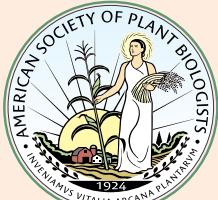
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ASPB News

THE NEWSLETTER OF THE AMERICAN SOCIETY OF PLANT BIOLOGISTS



President's Letter

Adjusting to an Uncertain Future

BY SALLY MACKENZIE
University of Nebraska-Lincoln

As we enter 2017, plant biologists face uncertainty with the arrival of President Trump. The new administration has provided few hints about a position on science, and what comments have been made appear worrisome. A Trump administration is not what most of us were expecting based on polling data and, in fact, was not what biologists had hoped for. A 2013–2014 survey found that only 5% to 6% of self-described professional biologists considered themselves “conservative” or “far right” in political views (Reardon, 2016).

One key concern, of course, is the future budget for science. Trump focused most of his public statements on issues such as national security, deteriorating infrastructure, and immigration. Whether pursuit of the administration’s goals in these areas will shrink the science budget remains to be seen. A second, even more pressing concern



Sally Mackenzie

is a seeming lack of respect by the new government for science, its process, and its importance to America’s health, safety, food security, and technological advantage. Now more than ever, it will be crucial that we justify the value of science not simply for science’s sake, but as the engine that fuels U.S. competitiveness.

Comments by the Trump campaign regarding climate change, safety of vaccinations, and environmental protection raise the question of whether sound science will hold sway in this new political climate. As Zhang (2016) wrote in a recent *Atlantic* article, “The trappings of science can be decoupled from the actual rigor of science. In a post-fact, post-expert world, science still holds currency. It just has to be *your* facts and *your* experts.” AAAS CEO Rush Holt (2016) noted in his recent commentary in *Science* that this lax

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Aloha!

Plant Biology 2017

June 24–28
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FIVE MAJOR SYMPOSIA

Away from the Brink—Toward the Sustainable Use of N and P in Agriculture

Evolution of Cellular Development

The Chemical Dictionary of Plants: Origin and Translation

Plants and Fungi: Friends or Foes?

Plant Scientist: Entrepreneur

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Copy deadline is the 5th day of the preceding even-numbered month (for example, April 5 for May/June publication).

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Let's Nominate!

The Call for Nominations for ASPB Council positions and ASPB awards is in full swing. A message was sent out to all members on January 3, 2017. Nominations for both are due Friday, February 17, 2017.

ASPB is offering numerous awards for individuals who have excelled in research, education,

outreach, and service to be presented during Plant Biology 2017 in Honolulu, Hawaii. To read more about each award being offered, go to <http://aspb.org/awards-funding/aspb-awards/>. It is important to our profession that we recognize our colleagues' efforts by taking time to nominate them for awards.

ASPB relies on a number of dedicated individuals in leadership who commit time and energy to leading the Society. Members will be voting for a president-elect and an elected member of the Council. We need nominees to consider for these positions, so do participate in the process and let your voice be heard by submitting

a nomination at <http://excom.aspb.org/>. A list of prior presidents who have served ASPB can be viewed at <http://aspb.org/about/past-presidents/>.

The deadline for nominations is fast approaching, so join your colleagues and nominate today! ■

2016–2017 Awards Committees

Listed below are awards committee members for the current year. The year in which each committee member's term ends is indicated in parentheses.

ASPB Innovation Prize for Agricultural Technology

Chris Somerville (four award cycles), *chair*
Jeff Dangl (two award cycles)
Jane Langsdale (three award cycles)
Toni Kutchan (three award cycles)
Elliot Meyerowitz (two award cycles)

Charles Albert Shull Award

Steve Briggs (2017), *chair*
Jiří Friml (2017), *past winner*
John Shanklin (2017)
Peggy Ozias Akins (2019)

Charles Reid Barnes Life Membership Award

Bob Buchanan (2017), *chair*
Karen Koch (2017), *past winner*
Barbara Mazur (2017)
Bill Lucas (2019)

Corresponding Membership Award

Hiroo Fukuda (2017), *chair*
Renate Scheibe (2019)
Alejandra Covarrubias (2020)
Wataru Sakamoto (2020)
Jian-Kang Zhu (2020)

Early Career Award

Michael Hahn (2017), *chair*
Cora MacAlister (2017), *past winner*
Jin Suk Lee (2017), *past winner*
Keiko Torii (2017)

Eric E. Conn Young Investigator Award

Danny Schnell (2021), *chair*
Christophe Maurel (2019)
Laurie Smith (2021)
Caren Chang (2021)

Excellence in Education Award

Stan Roux (2018), *chair*
Candace Galen (2017), *past winner*
Becca Dickstein (2018)
MariaElena Zavala (2019)

Fellow of ASPB Award

Jaakko Kangasjärvi (2017), *chair*
Janet Braam (2017)
Ann Hirsch (2018)
Sheila McCormick (2019)

Martin Gibbs Medal

Wolf Frommer (2019), *chair*
Craig Pikaard (2017), *past winner*
Alice Cheung (2017)
Gerald Berkowitz (2017)

Stephen Hales Prize

Alex Webb (2019), *chair*
Gloria Coruzzi (2017), *past winner*
Harkamal Walia (2019)
Natalia Dudareva (2019)

Summer Undergraduate Research Fellowship

Burkhard Schulz (2017), *cochair*
Michael Campbell (2017), *cochair*
Joseph Jez (2018)
Devi Prasad V. Potluri (2018)
Amy S. Verhoeven (2018)

PRESIDENT'S LETTER

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attitude toward scientific data is not limited to this most recent election rhetoric: "Over recent decades, a disturbing trend in the U.S. government has been for ideological assertions to crowd out evidence."

So on November 30, 2016, more than 2,300 U.S. scientists, including 22 Nobel laureates, issued an open letter to President-elect Trump and Congress urging them to respect science ("Science and the Public Interest," 2016). The letter asked for action in four areas: providing "a strong and open culture of science," ensuring that public safeguards like the Clean Air Act remain well grounded in science, maintaining high standards of scientific integrity and independence, and providing sufficient resources to enable federal scientists to carry out their crucial jobs.

Still, in the midst of what may seem a fairly bleak forecast, there remains some opportunity for plant biologists to consider potential alignments with the new administration. Trump has repeatedly emphasized his commitment to reductions in government regulations. This position may perhaps apply to

restrictions on genetic technologies for crop improvement as well. Until now, regulatory hurdles to the introduction of novel genetic traits derived by particular GM methodologies have been sufficiently prohibitive to limit innovations reaching the marketplace to solely those adopted by large agribusiness interests (Porterfield, 2016). Thus, to date, the vast majority of genetically engineered products have involved input traits to reduce farmer costs but with little recognized value to the consumer. A tempering of this regulatory environment may serve to broaden agricultural biotechnology opportunity to a greater number of academic scientists, creating an innovation space that is more consumer responsive and diversified.

A second area of possible alignment for plant biologists involves agricultural performance. Research in precision agriculture and newly emerging phenomics technologies may be perceived by the incoming administration as a logical strategy for enhancing agricultural efficiency and profitability. Opportunities to integrate engineering, computation, and fundamental plant science with agronomy and ecology will yield important technologies for

reducing agricultural input costs, empowering farmers with vital predictive capabilities for crop performance, and enhancing U.S. agricultural competitiveness. These goals may resonate with the Trump administration.

Finally, on a far more speculative level, there is the issue of international policy. The Trump administration has selected Michael Flynn as national security adviser. Following this announcement, Flynn indicated in a November 20 interview on CNN that he strongly favored a "Marshall Plan" for the Middle East and North Africa region. The Marshall Plan was a program put into effect after World War II to support the economic and political recovery of Western Europe. If this were to become policy in the Trump administration, such a plan might open the door to an effort sponsored by the U.S. Agency for International Development to stimulate research into the crops and crop production systems needed to support rapid revitalization of this war-torn region, research that the U.S. plant science community is eminently capable of supplying.

ASPB is working to learn the science priorities of the incoming administration and will provide

members with as much insight as possible. It is also the goal of ASPB, as always, to find every opportunity to educate members of the new administration about the importance of plant science research to the U.S. economy and national food security. These are uncertain times, folks, so our ability to work with all societies representing plant-related interests to speak with one strong and resonant voice will be essential. ■

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Plant Biology 2017

Say Aloha to Plant Biology 2017!

June 24–28, Honolulu, Hawaii

Mark your calendars! This year's annual Plant Biology conference will take place June 24–28, 2017, in the beautiful island state of Hawaii. More than 1,500 plant biologists from around the world will converge on Honolulu to share their most exciting work, build collaborations, and brainstorm about future research directions.

The conference will be held in the Hawaii Convention Center (<http://bit.ly/2hGEwd0>), just a short stroll from Waikiki Beach. Don't miss the exciting opportunity to talk science with members of the plant biology community while ambling through the Convention Center's rooftop tropical garden! Conference attendees qualify for special discounts at the conveniently situated Hilton Hawaiian Village (<http://bit.ly/2gMzVUL>), and child care will be available at the Convention Center.

Key dates to remember

January 30, 2017

Deadline for submission of abstracts to be considered for talks (<http://bit.ly/2gKwVdc>)

April 30, 2017

Registration deadline for early-bird rates (<http://bit.ly/2gKzZpm>)

May 24, 2017

Deadline for submission of abstracts to be included in the online program book and receive a poster number

May 27, 2017

Deadline for discount hotel rates (<http://bit.ly/2gMzVUL>)

June 12, 2017

Final deadline for abstract submissions

June 12, 2017

Deadline for standard registration

June 24–28, 2017

On-site registration during Plant Biology 2017!



Talks will be grouped into five major symposia and 30 concurrent symposia (<http://bit.ly/2hGGdXU>).

Saturday, June 24

SYMPOSIUM I

Away from the Brink—Toward the Sustainable Use of N and P in Agriculture

Fertilizers boost crop yields tremendously but can also pollute the environment. Talks in this symposium will present potential solutions to the pressing problems associated with nitrogen (N) and phosphorus (P) use in agriculture.



Organizer:

Michael Udvardi, Samuel Roberts Noble Foundation

Speakers:

Phil Robertson, Michigan State University

Helen Jarvie, NERC Centre for Ecology & Hydrology

Jonathan Lynch, Penn State University

John Peters, Montana State University

Saturday Evening

In the evening, Plant Biology 2017 continues with the Awards Symposium and presentation of the 2016 Stephen Hales Award to Gloria Coruzzi of New York University, who will give a talk on "The Fourth Dimension of Transcriptional Networks—Time." Jiří Friml, from the Institute of Science and Technology Austria, will receive the 2016 Charles Albert Shull Award and give a talk on "Auxin Transport-Mediated Polarity and Patterning in Plants."

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Plant Biology 2017

See you in paradise!

Visit <http://plantbiology.aspb.org> for more info on travel awards, discounts, and deadlines. Watch your email, and follow @ASPB and #plantbio17 on Twitter for the latest updates.

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Sunday, June 25

SYMPOSIUM II

Evolution of Cellular Development

Speakers will present exciting breakthroughs in understanding the regulatory programs that direct cell differentiation and their epigenetic regulation during the development of land plant bodies.



Organizer:

Liam Dolan, University of Oxford

Speakers:

John Bowman, Monash University
Keiko Sugimoto, RIKEN
Keiko Torii, University of Washington
Liam Dolan, University of Oxford

Monday, June 26

SYMPOSIUM III

The Chemical Dictionary of Plants: Origin and Translation

Talks in this symposium will describe research around the diversity of plants' chemical vocabulary and its effects on plant fitness. They will also outline new biotechnological applications for enhancing crop productivity and defense as well as improving flavor and aroma.



Organizers:

Natalia Dudareva, Purdue University

Eran Pichersky, University of Michigan

Speakers:

Harro Bouwmeester, Wageningen University and Research Centre

Natalia Dudareva, Purdue University

Elizabeth Sattely, Stanford University

Kazuki Sato, Chiba University

Tuesday, June 27

SYMPOSIUM IV

Plants and Fungi: Friends or Foes?

Speakers will look at the fascinating dual roles of fungi in their interactions with plants, as friends in such interactions as arbuscular mycorrhizal symbiosis and as foes in pathogenic interactions. Talks will highlight fungal infection mechanisms, plant defenses, and communication between beneficial fungi and their host plants.



Organizer:

Barbara Valent, Kansas State University

Speakers:

Barbara Valent, Kansas State University
Nicholas J. Talbot, University of Exeter
Peter Dodds, CSIRO
Uta Paszkowski, University of Cambridge

Wednesday, June 28

SYMPOSIUM V

Plant Scientist: Entrepreneur

These talks will turn from basic science to applications of research in business, specifically in start-ups created by plant biologists. The organizers have invited a lineup of experienced scientist-entrepreneurs to provide perspectives on translating basic research into applied research, private-sector funding, and life at small and large companies in the agricultural biotechnology sector.



Organizer:

Sally Mackenzie, University of Nebraska–Lincoln

Speakers:

Phil Benfey, Duke University
Michael Sussman, University of Wisconsin–Madison
Chris Somerville, UC Berkeley
Su-May Yu, Academia Sinica

Posters, Networking, and More!

In addition to this all-star lineup of symposia, ASPB has put together a fabulous set of poster sessions, networking opportunities, parties, and workshops. Plant Biology 2017 features 14 career-propelling workshops with sessions on sequencing data and bioinformatics, the Plant Science Research Network, international collaborations, ways to avoid mistakes in publishing, agricultural biotech products, and entrepreneurship. ■



Members of the ASPB Community Elected to the 2016 Class of AAAS Fellows

Ten members of the ASPB community were elected to the 2016 class of AAAS Fellows. Each year, the AAAS Council elects fellows based on their contributions to science and technology in the areas of research; teaching; technology;

services to professional societies; administration in academe, industry, and government; and communicating and interpreting science to the public. Fellows are recognized from within the AAAS membership for their "efforts on behalf of the advance-

ment of science or its applications [that] are scientifically or socially distinguished."

New fellows will be honored at the 2017 AAAS annual meeting in February with a certificate and a blue and gold rosette to symbolize their distinguished achievements.

Nominations for the 2017 class are open until April 26, 2017. Please view the nominating procedures at <http://www.aaas.org/current-nomination-cycle>.

Congratulations to the following ASPB members:



Steven D. Clouse
National Science Foundation



Walter Gassmann
University of Missouri



Alice C. Harmon
University of Florida



Stephen H. Howell
Iowa State University



Pal Maliga
Rutgers, The State University of New Jersey



Karen-Beth Goldberg Scholthof
Texas A&M University



Jeffrey Field Harper
University of Nevada, Reno



Krishna K. Niyogi
Howard Hughes Medical Institute/University of California, Berkeley/
Lawrence Berkeley National Laboratory



Sharlene C. Weatherwax
U.S. Department of Energy



Steven A. Whitham
Iowa State University

Emanuel Epstein: No Intelligent Life on Solid Ground in the Universe Without the Existence of Rooted Organisms

BY WIDMAR TANNER

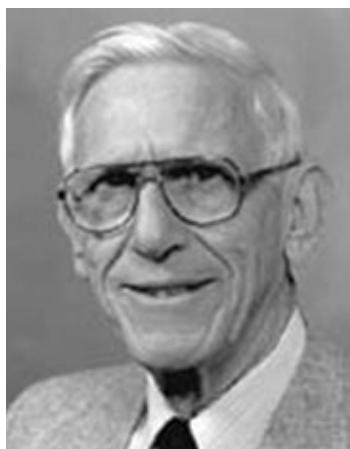
Universität Regensburg

Editor's note: ASPB is happy to publish this appreciation of University of California, Davis, Professor Emeritus Emanuel Epstein on the occasion of his 100th birthday.

A single rye plant may possess a root meshwork of more than 600 km total length—unbelievable, but measured by Dittmer (1937) after carefully isolating the main and all side roots of a four-month-old rye plant. Why do plants require such huge root systems, which frequently represent more in mass and surface area than the above-ground part?

Besides anchoring, roots above all withdraw water from the soil as well as the ions dissolved in it, like potassium, magnesium, calcium, iron, zinc, phosphorus, selenium, and half a dozen more. These elements, which partly exist in minute concentrations in the soil, are essential for plants, but also for animals and humans. We obtain them exclusively via the food chain through plants. Only our supply of kitchen salt, sodium chloride, do we have to obtain ourselves, since food plants do not require sodium. For that reason we have a salt shaker on our dining table, but no iron, magnesium, calcium, or sulfur shaker. For cattle, salt blocks have to be used.

How plants extract minerals from the soil has been intensively studied by Emanuel Epstein, the father of modern root physiology



Emanuel Epstein (born November 5, 1916), the father of modern root physiology and biochemistry.

and biochemistry. On November 5, 2016, the emeritus professor of plant biology of the Department of Plant Biology at UC Davis was 100 years old. Until recently, he cycled every day to his office; his doctor has now forbidden use of the bicycle.

Epstein started to investigate how ions are taken up by plant roots in the early 1950s (Epstein and Hagen, 1952). He demonstrated that their transport through the membrane of root cells is a catalyzed process. The postulated catalysts followed the behavior of enzymes (Epstein,

1953; Epstein and Hagen, 1952; Epstein et al., 1962) described by Michaelis and Menten (1913). This suggested protein-catalyzed mineral uptake, and thus root physiology, had caught up with biochemistry. Up to then, so-called lipid-filter theory dominated membrane transport physiology in general, which meant that uptake of a molecule into a cell is dependent solely on its size and its partition coefficient for oil and water and thus is a pure physical process. The protein-mediated membrane passage was finally proved in the years that followed, when the gene for the bacterial lactose permease was discovered in the French laboratory of Monod (Rickenberg et al., 1956), and the American biochemists Fox and Kennedy (1965) identified the corresponding protein.

Epstein (1973) pointed out the tremendous importance of the plant root for the existence of life: "It may be predicted with some assurance that, if intelligent life on solid land is ever discovered elsewhere in the universe, there as on the earth the world of life will consist of two kingdoms: plant and animal. Only mobile organisms will develop intelligence and only stationary ones can secure

from a solid substrate nutrient elements essential for the functioning of living matter."

We would have to extract 5 to 10 tons of soil to satisfy our daily requirement of phosphate, which amounts to 500 mg. But we could also satisfy that requirement with 100 to 200 g of vegetables and a steak, the steak having obtained its phosphate from plants, of course. The cells of plant roots are therefore not only equipped to specifically take up ions but also able to concentrate them 1,000- to 10,000-fold. Once it was shown that Mitchell's (1963) chemoosmotic theory for active transport of bacteria also holds for eukaryotic cells (Komor, 1973), a huge number of H+/substrate symporters were described in the decades to follow, and the high accumulating potential of root cells was in principle understood.

Epstein's suggestion that freely movable organisms, wherever existing in the universe on solid ground, require rooted partners to survive seems plausible: the former develop sensory organs to make optimal use of the possibility to freely move and a control center to process the signals and coordinate the locomotor system;

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Good Science Conquers Greatest Fear: The Unknown

BY JACK PAYNE
University of Florida

As part of the World Food Prize meeting in Des Moines, Iowa, in October, an ASPB member was honored for work that was compared to that of Neil deGrasse Tyson, Bill Nye, and Carl Sagan. And yes, even to Norman Borlaug.

I don't claim that University of Florida horticulture professor Kevin Folta has saved a billion lives. That's Borlaug's legacy. But the plaudits for Folta are because he's done as much as anyone in the past decade to help people understand the biotechnology behind what they eat.

What that means is he wants to help conquer fears. Because we live in an age of so much information, we also live in an age of misinformation. Often, I find, the very point of misinformation is to induce fear.

Celebrities, activists, and others bring an amplified voice to our public discussion of food, but too often they do so without solid scientific evidence to back their assertions and warnings. I see this as part of a larger antiscience ethos in some sectors of society. It muddles public understanding of important issues such as agricultural biotechnology, vaccinations, and climate change.

We in the scientific community acknowledge that we've not done a good enough job communicating to the public. Leaders such as Folta are trying to fix that. He wants to replace fear with fact. For that, he's been attacked relentlessly, from



Kevin Folta



Jack Payne

obscenity-laced social media messages to death threats.

His message isn't "Listen to me." It's to give a heads-up to identify whom to trust for information and to evaluate whether they back it with science. Even more difficult, he'd like to challenge people's beliefs, not have them retreat behind those beliefs when the beliefs appear to be at odds with new facts.

Few scientists do this as effectively as Folta. That's why his work is important. It's why the Ames, Iowa-based Council of Agricultural Science and Technology recognized him with its Borlaug CAST Communication Award.

Borlaug's granddaughter was among those who nominated Folta. She concluded her nomination letter by stating that she believed Folta would be her grandfather's nominee.

Nor does he communicate solely with the elite of academia. He frequently speaks at elementary schools and retirement homes. He has a highly rated science podcast on iTunes. He tweets out science. He blogs it. He meets you where you are. He does this because getting science out of the lab and to the people who can benefit from it is as important to him as discovery itself. So although Folta may not have saved a billion lives, he's trying mightily to make as many lives as he can better.

Fear is among the most powerful of feelings. It's up to scientists to help remove one of its leading causes—the unknown. We don't have enough scientists yet who have conquered their own fears of being targeted because they deliver the science to help others conquer theirs. It's the hope of CAST and of Folta that the award will inspire more scientists to talk more to the public and not just to their peers. ■

Jack Payne is the University of Florida's senior vice president for agriculture and natural resources and leader of the Institute of Food and Agricultural Sciences.

Plant Physiology®

Call for Papers

2018 Focus Issue on Cellular Dynamics

Edited by Dan Szymanski, Diane Bassham, Teun Munnik, and Wataru Sakamoto

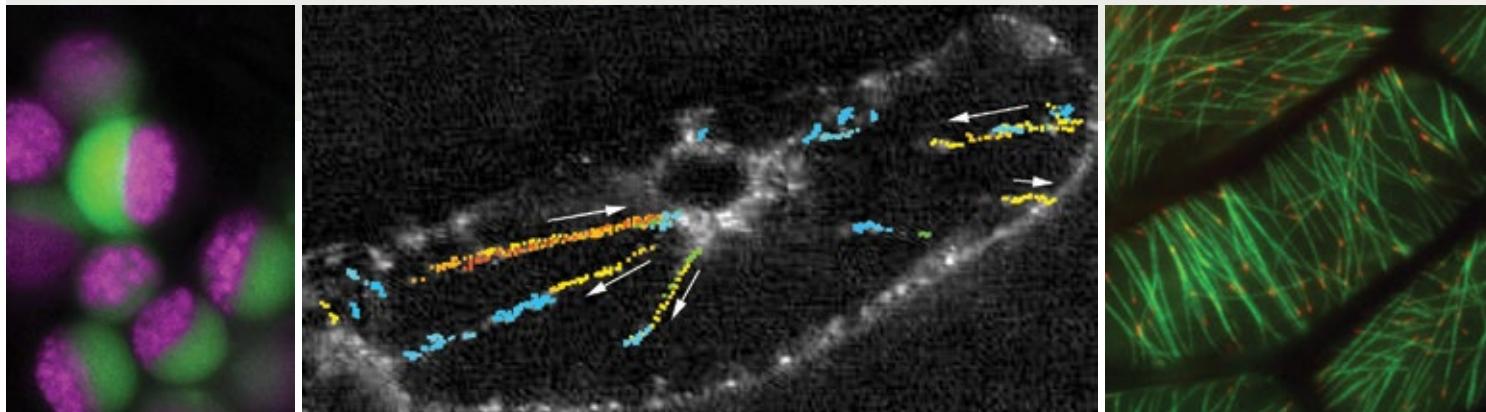
Deadline for Submission: June 5, 2017

To submit an article, go to <http://pphy.msubmit.net/>

Plant Physiology is pleased to announce a **Focus Issue on Cellular Dynamics**, to be published in January 2018. This is a very broad topic that encompasses a wide array of new research happening in this field. One goal of this issue is to provide a series of invited Update Reviews on hot topics in plant cell biology, with broad coverage of the major plant organelles and cytoskeletal systems. It is our intention that these reviews will be useful resources for the classroom and researchers who want to learn more about the established and newly discovered functions of plant organelles. The other goal is the publication of research articles in the realm of dynamic processes of plant cells. The issue will highlight new research that uncovers mechanistic details of the dynamic function of plant cells. Studies that include multivariate live cell imaging; computational modeling of cells, tissues, and organs; or technology development centered on imaging are particularly encouraged.

Authors interested in contributing should indicate this in the cover letter when submitting papers online at <http://pphy.msubmit.net/>. Please select “Cellular Dynamics” from the Focus Issue list in the online submission system. Articles published in *Plant Physiology* on this topic within 2 years before and after the Focus Issue publication date will be collected in an online Focus Collection.

Please contact Dan Szymanski (szymandb@purdue.edu), Diane Bassham (bassham@iastate.edu), Teun Munnik (T.Munnik@uva.nl), or Wataru Sakamoto (saka@okayama-u.ac.jp) for more information.



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.

Marja Timmermans

Alexander von Humboldt Professor

Center for Plant Molecular Biology, University of Tübingen, Germany

BY SUNIL KUMAR K R

ASPB Student Ambassador, University of Nebraska–Lincoln

Marja Timmermans began her scientific career at Cold Spring Harbor Laboratory (CSHL) after completing her studies in the Netherlands and at Rutgers University and Yale University. In 2015, she joined the Center for Plant Molecular Biology at the University of Tübingen after being awarded Germany's most prestigious international research award, the Alexander von Humboldt Professorship.

Marja's research focuses on developmental genetics, specifically on the formation and patterning of leaves. Her team has made several internationally acclaimed discoveries and explained key mechanisms behind leaf development and the role of mobile small RNAs in leaf polarity. She is one of the most highly respected plant geneticists in the world. She serves on the editorial board of several professional journals and on selection panels of organizations like the National Science Foundation and the Human Frontier Science Program.



Marja Timmermans

What was your motivation for choosing plant science as a career?

Actually, the decision to seek a career in science came quite late. As a child, I dreamed of becoming a detective who solved crimes, like in the mysteries I used to read. Only because I was too young to join the police academy did I go for a bachelor's degree in science. This was in the Netherlands, where I also worked for several years as a technician before deciding to move to the United States.

That proved to be a key decision. Labs were different, less hierarchical than what I had experienced, and I became more integrated into the actual scientific process. This was exciting! Science became less of a job and more about applying logic, skills, and deductive reasoning to solve problems, just of a different nature than I had envisioned as a child. So I decided to pursue a PhD and a career in science. As for plants, after some experience with microbiology and mouse tissue culture, I knew I wanted to use genetics to study biology at the whole organismal level. Plants offered tremendous possibilities, and so I went for it.

Who or what influenced you the most in your early career to be the scientist you are today?

There is not just one person or event, but joining Tim Nelson's lab at Yale University as a postdoc set the stage for my current research and likely also my mentoring style. He gave me tremendous freedom but could be counted on for

advice. The plant group at Yale also provided a stimulating environment that simplified the transition into developmental biology for me. Colleagues were interactive, helpful, and constructively critical. It was perfect for me.

Please describe your journey from being an international student in the United States to becoming a successful independent scientific leader.

I'm not sure what to say. I don't think there was anything particularly special about how my career developed. I loved what I did, worked hard, followed my ideas even when risky, listened carefully to advice, and took advantage of opportunities to interact with colleagues from all over the world. In addition, there was a bit of luck. The first leaf polarity mutants we cloned all showed connections to small RNAs. This was at a time when the RNAi and small RNA field was gaining tremendous importance. This work gave me visibility early in

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LUMINARIES *continued from page 11*

my career. Obviously, you still need to know what questions to ask and to be able to carve an interesting niche for yourself within a competitive field, but my career might have gone differently had the first polarity mutants turned out to be something else.

Do you see barriers for women in science? What are your suggestions to improve the situation?

Tough question, and not easily addressed in this short interview. Inequality manifests itself in many different ways, ranging from seemingly innocuous differences in the day-to-day interaction between colleagues, to real biases in hiring and promotion practices, to the perception of scientific quality. Improving the situation will take time. In particular, societal preconceptions that influence women's personal decisions to pursue a career and that often unjustly come into play when women are considered for jobs, promotions, awards, and so forth are not easy to change. Studies have shown that family and other matters not directly related to science, even looks and personality, are far more likely to be brought up in discussions of female versus male candidates.

Increasing the representation of women among faculty, on committees, and in other types of leadership positions will be essential, but I'm not a fan of quotas. Although I can see how these could speed up the process, they can have negative repercussions. This is 2017! There are many excellent female candidates for each of these functions, and likewise for opportunities such as

invited speakers, keynote addresses, awards, and other occasions leading to visibility. The effort just needs to be made.

What experiences and training do you think are important for early career scientists?

As a scientist, you need to be a jack-of-all-trades. Early on, technical competence and the ability to easily adopt the latest techniques are essential. Equally important is to really know the system or biological process you are studying. The famous book about Barbara McClintock, *A Feeling for the Organism* by Evelyn Fox Keller (W. H. Freeman, 1983), captures that well.

Think deeply and critically about your work. What are the data telling you, what not, and how exactly does it all fit into the big picture? Perhaps related to that, learn to take risk. Many breakthroughs stem from observations that didn't at first make sense. However, the ability to recognize when to pursue and when to drop something is key.

You also need to learn how to communicate effectively. The work can be terrific, but if it isn't presented well, the impact is likely to be lost. A common mistake is to go into so much detail that it blurs the main message. Keep it simple. Typically, less is more. Perhaps try to see how good speakers structure their presentations or writers their papers.

Finally, you need management skills, something we don't train for. More and more institutions have mentorships for junior faculty. If yours doesn't, try to arrange one. There will be lots of situations for which your PhD and postdoc did not fully prepare you.

What are your experiences organizing the CSHL plant course?

I love it! A lot goes into organizing this course, but every minute is worth it. The students taking the course are enthusiastic and eager to be there, and each year there is true talent among the participants. The topics covered are also more diverse than what I routinely read or hear, and so I learn a lot. Still, it is the interactions with the students as well as co-organizers and instructors that I particularly enjoy. The course's unique setting spurs many interesting discussions, and then there are the informal interactions. Through the late nights on the course lab balcony or at the bar, you get to know the students individually, and these interactions are really rewarding. If you get the opportunity to participate in the course, whether as a student or an instructor, I highly recommend it.

Share your experiences on being awarded the prestigious Alexander von Humboldt Professorship.

It is a tremendous honor. Six such professorships on average are awarded each year across all disciplines. There are few biologists among the recipients, and I was the first plant scientist to receive this award. It opens doors and provides real opportunities. In addition to the honor, the award comes with a substantial sum of money to establish a new research group in Germany. This allows me to pursue some challenging problems that are not easily approached through three-year renewable grant cycles. I was always interested in returning to Europe; the Alexander von Humboldt Professorship made that so much easier.

How was your transition from CSHL to Tübingen?

I received tremendous support from my family and my new colleagues at the University of Tübingen, which made the transition far easier than it could have been. Moving requires adjustment, but moving to a new country is extra challenging. Aside from the actual science, everything is organized differently in Germany compared with the United States. This has led to some funny anecdotes as well as the occasional frustration; stereotypes are based on some level of truth. Still, looking back on the past year or so, it has been an exciting and overall very positive change. There are still some challenges ahead of me, such as in teaching, but for now I am enjoying the new life.

Can you shed some light on similarities and differences in the way science is done in these two premier research institutes?

The two institutions show more differences than similarities. CSHL is unique. In the United States, there are few places that resemble it. In some way, the fact that Tübingen and CSHL are so different made the transition easier. I like both places and see pros and cons for each. I'll mention one point that I value for each.

At CSHL, I value the interdisciplinary interaction facilitated by its small size and access to the many meetings and courses. These have greatly influenced the research my group has done. At Tübingen, I very much appreciate that the constant worry about funding that affects most of the U.S. science community is barely noticeable. This changes the scientific atmo-

sphere. I see a greater emphasis on basic research here, and a willingness to take on high-risk or long-term projects. Some pressure is good, but too much stifles creativity. Perhaps science here is still more about curiosity than fundability. Time will tell.

What scientific advances and discoveries do you think have impacted plant scientists most in recent years? How have these discoveries influenced your research directions?

Well, there are many, and probably the longer I think about this question, the more will come to mind. So let me name just three that relate directly to the work we do:

1. Deep-sequencing technology not only has changed how we clone genes or profile expres-

2. RNAi and small RNAs affect many fundamental aspects of biology. Our focus has been on development, in which we showed that small RNAs serve as mobile instructive signals, but the discovery of small RNAs and RNAi has also drastically changed our views of epigenetics, gene regulation, and viral defense. And there is the obvious impact from their use as reverse genetics tools.
3. Microscopy has seen a number of advances that allow us to look at structures with ever-increasing resolution and sensitivity. In addition, through live imaging, it is now possible to get a dynamic view of developmental processes.

EMANUEL EPSTEIN
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the latter do the mining work. Epstein's prediction will most likely never be proven. However, new earthlike exoplanets are discovered daily (Petigura et al., 2013), so the question of whether life exists on other planets is more acute than ever.

Epstein (1972, 1973) described the tremendous importance of the plant's root more than 40 years ago. With his early publications, he established the basis for the work of hundreds of plant biochemists, who in the past 60

years have elucidated the molecular mechanisms of membrane transport in plants and are presently trying to produce crop plants optimized for humans and the environment. ■

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What are the key qualities you seek in a potential team member?

Number 1 is passion. It is really important that the candidate be excited about science and the research we do. I further look for intellect, someone who is logical and can arrive at testable hypotheses; technical skills, particularly the ability to learn or adopt new technologies; communication skills; independence; and team spirit.

What is your ideal relaxation after a busy day of work?

I am not a morning person and so tend to work late into the evening. After coming home, I don't typically do too much—work on a sudoku, read a book, or watch some TV. However, I like to be active on the weekends, go

into the city. This used to mean Manhattan, but now my husband and I often go to Amsterdam to see an exhibit, have dinner, or see family or friends. On other weekends we do the exact opposite and go out into nature. My husband lives in Switzerland, and we love to go hiking in the Alps. ■

Sunil Kumar K R is a graduate student at the University of Nebraska–Lincoln. He attended the CSHL Frontiers and Techniques in Plant Science course in 2015, for which Marja Timmermans was a co-organizer. You can read about his research on www.linkedin.com/in/SunilKumar-KR and follow him on twitter @Sunil_husker.



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Edited by Ronald Pierik, Julia Bailey-Serres, Alexander Ruban, and Astrid Wingler

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Plant Physiology is pleased to announce a **Focus Issue on Energy: Light and Oxygen Dynamics**, to be published in February 2018. Submissions on any aspect of plant biology regulated by factors associated with energy, light, and oxygen are welcome. This Focus Issue will consider topics ranging from cellular processes to developmental decisions, in the context of the organism and its interactions with a dynamic and challenging environment. Contributions might include mechanistic studies on light perception and signal transduction, energy sensing and metabolism, or low oxygen cues and responses. We also welcome submissions within this broad theme that advance mechanistic knowledge to improve crops.

Authors interested in contributing should indicate this in the cover letter when submitting papers online at <http://pphy.msubmit.net>. Please select “Energy: Light and Oxygen Dynamics” from the Focus Issue list in the online submission system. Articles published in *Plant Physiology* on this topic within 2 years before and after the Focus Issue publication date will be collected in an online Focus Collection.

Please contact Ronald Pierik (r.pierik@uu.nl), Julia Bailey-Serres (julia.bailey@ucr.edu), Alexander Ruban (a.ruban@qmul.ac.uk), or Astrid Wingler (astrid.wingler@ucc.ie) for more information.



Policy Update

BY LAUREN BROCCOLI
Lewis-Burke Associates, LLC

Congress Returns to Washington for the Lame Duck Session

Following the 2016 elections, lawmakers returned to Washington in November to begin the lame duck session of the 114th Congress. As previously reported, in October the House and Senate delayed action on fiscal year (FY) 2017 funding decisions and passed a continuing resolution (CR) that extended funding at FY2016 levels. The current CR expires on December 9, 2016 and at the time of writing it's expected that Congress will pass another stopgap measure that will run through April 28, 2017 maintaining federal spending at FY2016 levels, with some budget anomalies for specific agencies and programs like the Department of Defense.

Looking ahead, there is uncertainty surrounding the timing of the FY2018 budget request and the nomination and confirmation of a new Office of Management and Budget director. For now, federal research priorities and programs that support plant biology will likely continue and operate under FY2016 spending priorities through the remainder of FY2017.

NSF Authorization Legislation

The Senate Committee on Commerce, Science, and Transportation reported out S.

3084, the American Innovation and Competitiveness Act, authorization legislation for NSF, the National Institute of Standards and Technology, and the White House Office of Science and Technology Policy. This effort represents a bicameral compromise with the House Science Committee on its version of this authorization legislation, H.R. 1806, the America COMPETES Reauthorization Act of 2015.

The following provisions are of importance to ASPB priorities. The legislation

- reaffirms the merit-based peer review process, which considers both intellectual merit and broader impacts;
- continues the Experimental Program to Stimulate Competitive Research (EPSCoR) Program, with updates to the award structure;
- evaluates midscale project investment gaps;
- creates an interagency working group within the Office of Management and Budget that will decrease burden on academic researchers;
- directs NSF to create a Center of Excellence on STEM research and best practices; and
- establishes a new interagency federal STEM workforce working group.

The bill is progressing via the hotline process and is expected to pass the Senate and then the

House before Congress adjourns. At the time of writing, the final agreement had not yet been posted to a public website; rather, congressional committee staff shared it with the community.

Source and Additional Information

- A summary of S. 3084 is available at <http://tinyurl.com/grt3ueg>.

House Passes 21st Century Cures Act

On November 30, 2016, the U.S. House of Representatives passed, by a vote of 392 to 26, a revised version of the 21st Century Cures Act, which would create an NIH Innovation Account to support funding for priority programs including the Cancer Moonshot, the Precision Medicine Initiative, and the BRAIN Initiative. The bill would direct \$4.8 billion over 10 years into the Innovation Account for support of these activities. The bill also includes a number of provisions that would accelerate Food and Drug Administration (FDA) approval of drugs and medical devices and would provide \$500 million for these activities at FDA over 10 years. Additionally, several provisions included in the bill are designed to reduce administrative burden on researchers. At the time of writing, the Senate was expected to vote on and pass the bill.

Source and Additional Information

- The House version of the bill is available at <http://tinyurl.com/z5axe7h>.

OSTP Request for Information: Framework for a Federal Strategic Plan for Soil Science

Following World Soils Day, the White House Office of Science and Technology Policy (OSTP) released a request for information (RFI) for the Framework for a Federal Strategic Plan for Soil Science. This opportunity follows an OSTP announcement in October that called for commitments and recommendations in soil science innovation.

Although it's unclear how (or whether) the incoming administration's policy will impact this ongoing soil science initiative, federal agencies like USDA will continue to implement current research priorities and initiatives for the foreseeable future.

Source and Additional Information

- Full details on the RFI are available at <http://tinyurl.com/jhj3kbe>. ■

ASPB and Other Leading Scientific Organizations Reach Out to Trump

BY TYRONE SPADY
ASPB Legislative and Public Affairs Director



On November 23, 2016, ASPB, AAAS, and 27 other leading U.S. scientific organizations and professional societies sent a letter to President-elect Donald Trump. The letter urged Trump to "quickly appoint a science adviser with the title of Assistant to the President for Science and Technology who is a national respected leader with the ap-

propriate engineering, scientific, management and policy skills necessary for this critically important role."

The science adviser to the president heads the White House Office of Science and Technology Policy, the body charged with coordination of the dozens of federal agencies that fund or support the nation's research enterprise and provide advice to

the White House on science- and technology-related matters. Since 2009, this position has been held by John Holdren. The letter did not recommend specific individuals for this important post, instead focusing on getting on the radar of the Trump transition team. The multisociety transition letter can be viewed at <http://tinyurl.com/gwzgvnv>. ■

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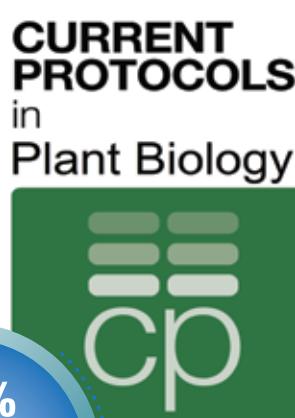
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ASPB Education and Outreach Road Show Rolls On: NABT 2016, Denver

BY SCOTT WOODY
University of Wisconsin–Madison

The ASPB Education Committee continued its long tradition of reaching out to educators where they gather to promote the use of plant model systems in K–16 classrooms and to provide expert guidance to teachers who struggle with the task or simply want to learn of the latest in teaching resources developed by ASPB membership and affiliated groups (e.g., Botanical Society of America, the Howard Hughes Medical Institute [HHMI]). The National Association of Biology Teachers (NABT) Professional Development Conference was held November 3–6, 2016, in Denver, Colorado, and, with the able and eager assistance of volunteers from area plant biology departments, once again the ASPB booth was a “can’t miss” destination among NABT visitors to the exhibition hall.

We were pleased to showcase the educational resources under development by Gloria Muday, Hanya Chrispeels, Michelle Klosterman, and Carole Browne (Wake Forest University), recent recipients of a Plant BLOOME award for development of GMO-related educational materials that can help students better understand the technology involved and the basis of arguments for and against contemporary approaches to crop improvement.

In addition to the many educational resources developed



Hanya Chrispeels displaying visual aids useful to educators to help students understand the contributions of plant biology and plant biologists to world health and nutrition.

by ASPB membership—*My Life as a Plant* activity books, the 12 Principles of Plant Biology bookmarks, ASPB journal cover prints suitable for framing, and hard-copy summaries of educational resources and activities available on Plantae—the booth also devoted stations to promote the Planting Science program and HHMI’s BioInteractive video series. *Popped Secrets*, a recent release by HHMI, describes the domestication and (consequently) accelerated evolution of *Zea mays*,



Chien-Yuan (Kevin) Lin (middle) and Jacqueline Chaparro (left) explaining how biology teachers can use ASPB resources to enhance their curricula and student educational outcomes.



Scott Woody (co-organizer of the ASPB booth) describing FPsc genetic resources to biology teachers.

with the student-friendly popcorn variety as star of the DVD.

Several booth stations were on offer from the FPsc (Fast Plants, self-compatible) Genetic Resource Development Center

at the University of Wisconsin–Madison (Rick Amasino and Scott Woody, directors). FPsc is a self-compatible analog of the self-incompatible Wisconsin

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NABT 2016 continued from page 17

Fast Plants model system for hands-on exploration of plant biology. Rick, Scott, and students used a mutagenesis screen to generate a collection of mutant derivatives whose phenotypes are unambiguously distinct from the wild type and whose transmission from parent to progeny plants epitomizes the behavior of both dominant and recessive Mendelian characters. Concurrently, students created a genomewide collection of polymerase chain reaction-based molecular markers useful for localization and characterization of mutant alleles.

A second FPsc station described ongoing efforts to optimize and enhance student-directed experiments in artificial selection, including the results of quantitative trait locus analysis to identify *Brassica rapa* loci that condition expression of continuously variable phenotypic traits. Finally, a third station presented a web-accessible genetic mapping simulation program that enables students to make a clear connection between mutant phenotypes and underlying DNA sequence-based genotypes (available at sim.fpsegenetics.org).

NABT 2016 was the first time most local volunteers had participated in an ASPB outreach event, and most were pleasantly surprised to discover that biology teachers who visited the ASPB booth are creative and dedicated to the task of incorporating plants in their biology curriculum through activities ranging from studies of light-dependent plant growth to plant tissue culture experiments. Local volunteers also came away from the outreach experience

with a greater appreciation of the generous contributions of ASPB membership to our shared commitment to enhance student education in plant biology.

The next events on the Education Committee outreach schedule include AAAS Family Science Days in Boston, March 18–19, and the National Science Teachers Association national meeting in Los Angeles, March 30–April 2. If you live and work in the Boston or Los Angeles areas and might like to try your hand at outreach, please do not hesitate to drop an email to Scott Woody (swoody@wisc.edu). You will not regret it! ■



Damian Guerra guiding biology teachers through ASPB educational resources.



Damian Guerra, Scott Woody, and William Adams sharing a slow moment in an otherwise busy outreach booth at NABT.

Thanks to All ASPB Booth Volunteers

Valerie Haywood, ASPB Education Committee, Case Western Reserve University

Scott Woody, ASPB Education Committee, University of Wisconsin–Madison

William Adams, University of Colorado–Boulder

Damian Guerra, University of Colorado, Anschutz Medical Campus

Jacqueline Chaparro, Colorado State University

Ruth Watson, Colorado State University

Chien-Yuan (Kevin) Lin, National Renewable Energy Laboratory

ASPB Welcomes Teresa Myers as Our New Meetings Coordinator

We are delighted to announce that Teresa Myers joined ASPB's staff on January 3, 2017, as our new meetings coordinator. In that capacity, Teresa will deliver first-rate customer and meeting management services to ASPB's meeting and event clients. Her primary responsibility will be the oversight and management of all meetings and events for which ASPB has been contracted to offer meeting/conference services. She will also work closely with ASPB

staff to plan, implement, and execute the Program Committee meeting logistics.

Teresa's career in the meetings industry began five years ago after a chance visit to Las Vegas, where she received a firsthand look at the convention center's operations and was deeply intrigued. She returned on a mission to enter and thrive in the industry. Since then she's graduated with honors from Prince George's Community College with a degree in meetings and event management. Teresa comes to

ASPB from the American Nurses Association, where she served as lead registrar for the organization's four conferences, including its annual conference, which hosted nearly 10,000 attendees in 2016. As a passionate meetings professional, Teresa has been awarded several industry awards, most notably the Professional Convention Management Association's 2016 Convening Leaders Scholarship. The scholarship awarded her the opportunity to travel to Vancouver, British Columbia (all expenses



paid), and experience the meetings profession's most prestigious and well-attended conference. When she's not engrossed in meetings work, she enjoys traveling with her family, thrift store scavenging (thrifting), and binge watching HGTV.

Welcome Teresa! ■

Call for Nominations ASPB Council

ASPB members are invited to submit a nomination for the office of president-elect and elected member of the ASPB Council. The Society's ongoing success is rooted in leaders who promote our mission and create new ways to serve ASPB members, the plant biology community, policy makers, and the general public. Each nomination matters! Please nominate ASPB's future leaders by February 17, 2017!

To submit a nomination go to <https://aspb-excom.secure-platform.com/a/>.

2017 ASPB Awards Get Nominating!

In 2017, ASPB will award accomplished plant biologists across all areas of plant science and at all stages of their career. The 2017 awards will be presented during Plant Biology 2017 in Honolulu, Hawaii. Nomination procedures and a list of the 2017 awards are available online. Nominations must be submitted electronically by February 17, 2017.

For more information on ASPB's nomination procedure, go to <https://aspb-awards.secure-platform.com/a/>.

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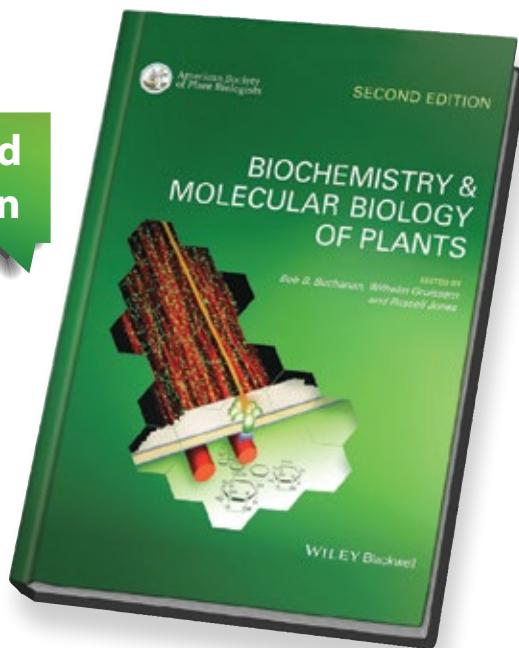
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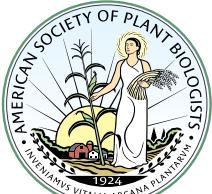
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