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# ASPB *News*



THE NEWSLETTER OF THE AMERICAN SOCIETY OF PLANT BIOLOGISTS

## Plant Biology 2018

One Destination, Two Meetings, Three Societies



*Downtown Montreal from Parc du Mont-Royal*

**P**lant Biology 2018 will be held July 14–18 in Montreal. This year's Plant Biology meeting is cohosted by ASPB, the Canadian Society of Plant Biologists (CSPB), and the International Society of Photosynthesis Research (ISPR). The ISPR meeting Photosynthesis from Light to Life (July 17–20) will overlap with Plant Biology 2018, giving attendees the opportunity to attend both meetings.

### Partners in Promoting Plant Biology

It is a long-standing tradition for ASPB and CSPB to hold joint conferences, as their missions align nicely. Both societies have dual goals of supporting research in plant biology and working to address the range of issues faced by plant biologists.

*continued on page 6*

## Let's Nominate!



The Call for Nominations for ASPB Board of Director positions and the 2018 ASPB Awards is in full swing. An email message was sent out to all members on January 3, 2018; nominations for both awards and board positions are due Wednesday, February 14, 2018.

ASPB is offering numerous awards for individuals who have excelled in research, education, outreach, and service. Awards will be presented during Plant Biology 2018 in Montreal, Canada. To read more about each award, 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 who commit time and energy to leading the Society. Members will be voting for a president-elect and an elected member of the Board of Directors. Please 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 please join your colleagues and nominate today! ■

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## ASPB Council

<b>President</b>	Harry Klee
<b>Immediate Past President; Chair</b>	Sally Mackenzie
<b>President-elect</b>	Rob Last
<b>Secretary</b>	Andrew Bent
<b>Treasurer; Chair, Board of Trustees</b>	Rick Vierstra
<b>Elected Members</b>	Christine Foyer Maureen McCann
<b>Chair, Membership Committee</b>	Jill Deikman
<b>Chair, Minority Affairs Committee</b>	Gustavo MacIntosh
<b>Chair, Publications Committee</b>	Neil E. Olszewski
<b>Chair, Women in Plant Biology Committee</b>	Laura Wayne
<b>Chair, Education Committee</b>	Sarah Wyatt
<b>Chair, International Committee</b>	Leon Kochian
<b>Chair, Science Policy Committee</b>	Nathan Springer
<b>Sectional Representatives</b>	
<b>Mid-Atlantic Section</b>	Hua Lu
<b>Midwestern Section</b>	Gustavo MacIntosh
<b>Northeastern Section</b>	Peter Melcher
<b>Southern Section</b>	Ashlee McCaskill
<b>Western Section</b>	Kulvinder Gill
<b>Environmental and Ecological Plant Physiology Section</b>	Andy VanLoocke

Council members highlighted in blue also serve on the Board of Directors.

## ASPB Staff

<b>Chief executive officer</b>	Crispin Taylor, ctaylor@aspb.org
<b>Director of finance and administration</b>	Clara Woodall, cwoodall@aspb.org
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The *ASPB News* is distributed to all ASPB members and is also available online. It is published six times annually in odd-numbered months. Its purposes are to keep membership informed of ASPB activities and to reinforce the value of membership. The *ASPB News* is edited and produced by ASPB staff from material provided by members and other interested parties.

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

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Harry Klee

## Why Are You an ASPB Member?

BY HARRY KLEE  
University of Florida

**W**hy did you join ASPB? Why do you continue to be a member? We need to know the answers to these questions.

As I mentioned in my first President's Letter, there has been a slow but continuous erosion in membership over the past decade. It is vital that we understand what you value most about ASPB membership. Which services and resources do you most and least value? You can help us understand the community we serve and enable us to stay important to your professional development.

It is in this spirit that we are undertaking a broad member survey to accurately measure what you most value. In the near future, you will receive an email asking you to take about 20 minutes of your time to complete a questionnaire. Please accept this invitation. The larger the response, the more accurate the results and the better ASPB can serve you. We are starting with current members because you have chosen to engage with the Society; after we assess the results, we intend to broaden the survey to the broader plant biology community. The end result will be a Society focused on what you most value.

We have a finite amount of money to fund everything we do. Revenues come into the Society

principally through membership dues, journal subscriptions, and our endowment. Obviously, if membership drops, so does that source of revenue. Open access and heightened competition threaten journal revenues in ways that are still not totally apparent. It is in the context of tight budgets that we will take a hard look at what we provide to you. We must strengthen or add services you care about and perhaps jettison activities you do not value. With the proper information from our members, change will be a very good thing and will keep ASPB vibrant.

It would be impossible to summarize all of the products and benefits ASPB provides to its diverse community in a short letter, but the following are our largest investments:

- ASPB journals are, together with the annual meeting, the face of our Society. We strive to produce the best possible products. The journals require major investment to add features and services to make the experience better for authors and readers.
- The annual meeting is our showcase. It is an opportunity to learn from and interact with the plant biology community. Our goal has always been to break even financially. So we don't make significant money

on this event, but it is an essential part of our mission. Travel grants are intimately tied to the annual meeting. These are a large and, I believe, essential investment in our future. Meeting travel grants are strongly tied to our efforts in education and career development.

- Regional meetings are the first point of Society contact for many students, and often their first opportunity to give professional talks and their first exposure to members from other institutions.
- We provide tools that help our youngest members establish their careers. A good deal of those efforts are focused on women and minorities. These tools include job notices and workshops that cover an array of career preparation and development topics. Personally, I think we do a great job of launching careers, and we need to do better at keeping young scientists engaged after finishing their training.
- Public policy is a critical and expensive part of our mission. This effort encompasses educating our legislators about the value of plant science and educating you about policy issues of importance. Another point of emphasis in our survey will be how you

interact with your Society. How many members read this newsletter? How many of you have accidentally blocked incoming ASPB mail as spam because we have not figured out a way to prioritize the messages on the basis of content? How many of you don't regularly use email and rely instead on social media such as Facebook and Twitter for your news? The reason that the way you communicate with ASPB (and its journals) is critical lies in our investment in online resources. The Society is investing a lot of money in the Plantae digital ecosystem, and it is critical that we channel our resources in the right way. Is Plantae the best use of our money? How can we make Plantae work for you?

I believe that the staff and my elected predecessors have done an outstanding job of shepherding the Society. Any pundit who claims to understand the consequences of open access for journal revenue streams is living in a dream world. We can't be certain what the financial future holds. Just as in the technology space, any company or institution that is complacent is doomed to mediocrity. I consider this survey to be an opportunity to prioritize what our membership wants, and I urge you to participate (<https://aspb.org/survey/>). ■

# ASPB Officers and Committee Members Assume Posts for 2018

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

## Board of Directors

Harry Klee (2018), *president*  
Rob Last (2019), *chair, president-elect*  
Andrew Bent (2019), *secretary*  
Rick Vierstra (2021), *treasurer*  
Christine Foyer (2021), *elected member*  
Maureen McCann (2019), *elected member*  
Crispin Taylor, CEO (*nonvoting*)

## Board of Trustees

Rick Vierstra (2020), *chair, treasurer*  
Bonnie Bartel (2018)  
Kathy Osteryoung (2019)  
Julia Bailey-Serres (2021)  
Crispin Taylor, CEO (*nonvoting*)

## Constitution and Bylaws

Debby Delmer (2018), *chair*  
Ken Keegstra (2018)  
Peggy Lemaux (2020)

## Council

Harry Klee (2019), *president*  
Sally Mackenzie (2018), *chair, immediate past president*  
Rob Last (2020), *president-elect*  
Andrew Bent (2019), *secretary*  
Rick Vierstra (2020), *treasurer; chair, Board of Trustees*  
Christine Foyer (2021), *elected member*  
Maureen McCann (2019), *elected member*  
Jill Deikman (2019), *chair, Membership Committee*  
Leon Kochian (2018), *chair, International Committee*  
Gustavo MacIntosh (2020), *chair, Committee on Minority Affairs*

Neil E. Olszewski (2019), *chair, Publications Committee*  
Nathan Springer (2020), *chair, Science Policy Committee*  
Laura Wayne (2020), *chair, Women in Plant Biology Committee*  
Sarah Wyatt (2019), *chair, Education Committee*  
Hua Lu (2019), *Mid-Atlantic Section representative*  
Gustavo MacIntosh (2020), *Midwestern Section representative*  
Peter Melcher (2018), *Northeastern Section representative*  
Ashlee McCaskill (2020), *Southern Section representative*  
Kulvinder Gill (2020), *Western Section representative*  
Andy VanLoocke (2020), *Environmental and Ecological Plant Physiology Section representative*  
Crispin Taylor, CEO (*nonvoting*)

## Education Committee

Sarah Wyatt (2019), *chair*  
Erin Friedman (2018)  
Ken Helm (2018)  
Scott Woody (2018)  
Valerie Haywood (2019)  
Estelle Hrabak, (2021)  
Christine Palmer (2021)  
MariaElena Zavala (2021)

## International Committee

Leon Kochian (2018), *chair*  
Kendal Hirschi (2018)  
Kazuki Saito (2018)  
Kranthi Mandadi (2019)  
Bijay Singh (2019)  
Jurandir Magalhaes (2020)

## Membership Committee

Jill Deikman (2019), *chair*  
Prateek Tripathi (2018), *postdoc member*  
Stephanie Klein (2019), *graduate student member*  
Catharina Coenen (2019)  
Ken Korth (2019)

## Minority Affairs Committee

Gustavo MacIntosh (2020), *chair*  
Michael Gonzales (2018)  
Sona Pandey (2018)  
Savithamma Dinesh-Kumar (2019)  
Terri Long (2019)  
Miguel Vega-Sanchez (2019)  
Thelma Madzima (2020)  
Neelima Sinha (2020)

## Nominating Committee

Rob Last (2020), *chair, president-elect*  
Harry Klee (2019), *president*  
Sally Mackenzie (2018), *immediate past president*

## Program Committee

Andrew Bent (2020), *chair, secretary*  
Rob Last (2018), *president-elect*  
Alice Harmon (2018), *past secretary*  
Maria Harrison (2018)  
Phil Taylor (2018)  
Gilles Basset (2020)  
Stacey Harmer (2021)

## Publications Committee

Neil E. Olszewski (2019), *chair*  
Pamela J. Hines (2023)  
Katayoon (Katie) Dehesh (2019)  
Steve Theg (2021)  
Hong Ma (2022)

## Science Policy Committee

Nathan Springer (2020), *chair*  
Sally Mackenzie (2018), *immediate past president*  
Rebecca Bart (2018)  
José Dinneney (2018)  
Jim Carrington (2019)  
Shandrea Stallworth (2019), *early career representative*  
Neal Stewart (2019)  
Judy Callis (2020)  
Jeffrey Chen (2021)  
Alan Jones, *ad hoc member*

## Women in Plant Biology Committee

Laura Wayne (2020), *chair*  
Eva Farre (2018)  
Li Tian (2018)  
Sreekala Chellamma (2019)  
Kelly Marie Gillespie (2020)  
Grace Miller (2020) ■

# 2018 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.

## Charles Albert Shull Award

John Shanklin (2018), *chair*  
Blake Meyers (2018), *past winner*  
Peggy Ozias Akins (2019)  
Patricia Bedinger (2020)

## Charles F. Kettering Award

Don Ort (2020), *chair*  
David Kramer (2018), *past winner*  
Andreas Weber (2020)  
Lisa Ainsworth (2022)

## Charles Reid Barnes Life Membership Award

Bill Lucas (2019), *chair*  
Susanne Von Caemmerer (2018), *past winner*  
Karen Koch (2019)  
Dean DellaPenna (2020)

## Corresponding Membership Award

Mondher Bouzayen (2021), *chair*  
Renate Scheibe (2019)  
Alejandra Covarrubias (2020)  
Wataru Sakamoto (2020)  
Jian-Kang Zhu (2020)

## Dennis R. Hoagland Award

Mary Lou Guerinot (2021), *chair*,  
*past winner*  
Katayoon (Katie) Dehesh (2021)  
Eduardo Blumwald (2024)  
Gloria K. Muday (2024)

## Early Career Award

R. Keith Slotkin (2020), *chair*  
Julia Santiago Cuellar (2018), *past winner*  
Lucia Strader (2020)  
Hiroshi Maeda (2020)

## Excellence in Education Award

Stan Roux (2018), *chair*  
Sarah Wyatt (2018), *past winner*  
Becca Dickstein (2018)  
MariaElena Zavala (2019)

## Fellow of ASPB Award

Eran Pichersky (2020), *chair*  
Ann Hirsch (2018)  
Sheila McCormick (2019)  
Ed Cahoon (2020)

## Lawrence Bogorad Award for Excellence in Plant Biology Research

Maureen Hanson (2020), *chair*  
Pal Maliga (2018), *past winner*  
Steve Rodermel (2018)  
Maria Harrison (2020)

## Robert Rabson Award

Candace Haigler (2018), *chair*  
Xiaobo Li (2018), *past winner*  
Ken Keegstra (2022)  
Diane Okamuro (2022)

## Stephen Hales Prize

Alex Webb (2019), *chair*  
Julia Bailey-Serres (2018), *past winner*  
Natalie Dudareva (2019)  
Harkamal Walia (2019)

## Summer Undergraduate Research Fellowship

Joseph Jez (2018), *chair*  
Devi Prasad V. Potluri (2018)  
Amy S. Verhoeven (2018)  
Adán Colón-Carmona (2021)  
Jon Monroe (2021) ■



## Fond Farewell to Patti Lockhart, ASPB Managing Editor

The staff and editorial boards of ASPB, *The Plant Cell*, and *Plant Physiology* offer our appreciation and best wishes to Patti Lockhart, who is leaving her position as managing editor of the ASPB journals for a new opportunity at the Transportation Resource Board of the National Academies.

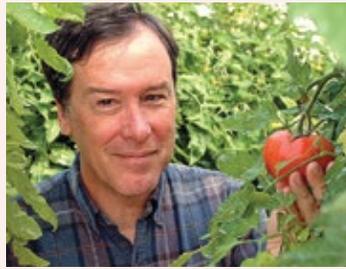
Patti has been with ASPB since June 2011. During her

tenure, she oversaw the transition to online-only publication of the journals and considerable modernization of both the electronic publishing platform and the behind-the-scenes review process. In addition, she helped adopt technologies to reduce production costs and streamline workflows. Before joining ASPB Patti ran the editorial department at Dartmouth Journal

Services, following a degree in English from Tufts University and a few years of international travel. Patti has been a terrific, hard-working, and dedicated colleague, and we wish her well as she takes on her new role at the National Academies in Washington, D.C. ■

# Plant Biology 2018

July 14–18, 2018, Montreal, Canada



“Science can make a real and positive impact on agriculture and society as a whole. Doing great science is only the beginning of a long road. The work that our industry members perform is both challenging and incredibly rewarding.”

—Harry Klee, ASPB President

## PLANT BIOLOGY 2018 *continued from page 1*

Founded in 1924, ASPB's mission is “to promote the growth and development of plant biology, to encourage and publish research in plant biology, and to promote the interests and growth of plant scientists in general.” Similarly, CSPB, founded in 1958, “provides a forum for plant scientists in Canada to meet and discuss not only the latest scientific developments in the field, but also the political, social, and financial issues that we all face as we develop our research and/or teaching careers.”

The newcomer in this triumvirate, ISPR, was formed in 1995 to organize the International Congress on Photosynthesis. The Photosynthesis from Light to Life conference is part of ISPR's efforts to strengthen ties between photosynthesis and plant biology scientists in North America (see page 7 for shared symposia lineup at Plant Biology 2018).



## In the Presidents' Words

Harry Klee, who holds the Dickman Chair for Plant Improvement at the University of Florida in Gainesville, took up the ASPB presidency in October. Harry's broad experience in academia and industry sets the stage for the ASPB President's Symposium and a broader call to action for plant biologists. For this symposium, “Translational

Science,” Harry wrote, “I have chosen a set of speakers who exemplify translational science. These speakers are all outstanding scientists who have taken fundamental discoveries out of the lab and into the real world.”

Geoff Wasteneys, who is based at the University of British Columbia in Vancouver and holds a Canada Research Chair in plant cell biology, has been serving as

CSPB president since July. “It is exciting to be part of the team that is organizing Plant Biology 2018,” wrote Geoff. “One thing I really enjoy doing is dreaming up a list of remarkable scientists and then bringing them together. I have the privilege of doing just that for the CSPB President's Symposium, which will provide a wonderful mash-up of ideas on the signaling and transport mechanisms that affect plant development.”

Wim Vermaas, of Arizona State University in Tempe, was elected president of ISPR last year. He wrote, “This meeting will provide an integration of photosynthesis and plant biology. The two are fully intertwined: for the great majority of plants, photosynthesis is a fundamental part of metabolism and physiology, and plant biology often cannot be fully understood without taking into account photosynthetic processes. However, until now, the two research areas were rather separate in North America. This is why bringing together plant biologists and photosynthesis researchers is so important, and why I encourage all participants to sample research on ‘both sides of the aisle.’”

For Plant Biology 2018 updates, join the Plantae network for ASPB conferences (<https://tinyurl.com/ydfou83q>), follow #plantbio18 on Twitter, and keep an eye on the program at <https://plantbiology.aspb.org/>. ■



## Dates to Remember

**Mid-December 2017**  
Registration opened

**February 20, 2018**  
Deadline to be considered for a Concurrent Symposium or lightning talk

**June 1, 2018**  
Deadline to be included in the online program book and receive a poster number

**July 6, 2018**  
Deadline for late abstract submissions to be on the app

**July 14–18, 2018**  
Plant Biology 2018

**July 17–20, 2018**  
Photosynthesis from Light to Life



The best thing about a meeting like this is that you can get exposed to all sorts of stuff you're not familiar with, while not missing out on the latest discoveries in your own area of specialization. Everyone gets smarter."

—Geoff Wasteneys, CSPB President

## Shared Symposia

The lineup at Plant Biology 2018 will feature two President's Symposia and two Joint Symposia.

### ASPB President's Symposium

#### Translational Science

with talks from Ian Graham, Marty Yanofsky, David Mackill, and Sherri Brown

### CSPB President's Symposium

#### Integrating Signals in Plant Cell Biology and Development

with Karin Schumacher, Liz Haswell, Daphne Goring, and Mark Estelle

### CSPB-ASPB Joint Symposium

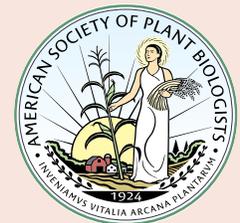
#### Opening Research Avenues Through New Technologies

with Todd Mockler, Amy Marshall-Colon, Karen Tanino, and Dan Voytas

### ISPR-ASPB-CSPB Joint Symposium

#### The Ecophysiology of Photosynthesis from the Leaf to Global Scale

with Elizabete Carmo-Silva, Joy Ward, Beverly Law, and Joe Berry



Conferences of this nature are useful to researchers at all stages of their career, from students to seasoned investigators, because they (1) hear about new ideas and results that then inform their own research directions and (2) get to know other researchers in the field, discuss each other's work, get new ideas, and set up collaborations. From my own experience, interactions between early-career and more senior researchers can be very productive for all parties involved."

—Wim Vermaas, ISPR President

# ASPB Has a New Section for Primarily Undergraduate Institutions

**A**SPB is a leader in supporting career development opportunities for a wide variety of plant scientists at all career stages and institution types. A prominent group of members are those associated with Primarily Undergraduate Institutions (PUIs) as faculty or students at PUIs, graduate students or postdocs interested in a career at a PUI, or individuals with collaborations or other connections with PUIs. Evidence of the prevalence of PUI-affiliated

individuals in ASPB is the fact that 21% of research abstracts submitted for the 2016 Plant Biology meeting in Austin and the 2017 meeting in Honolulu involved work that was wholly or partially conducted at a PUI.

Many professional challenges faced by members of PUIs are unique to these types of schools. For this reason, individuals among the ASPB membership have organized specific programming geared toward PUI faculty and PUI-interested members,

such as the PUI networking sessions and workshops that have been held during Plant Biology meetings for over 20 years.

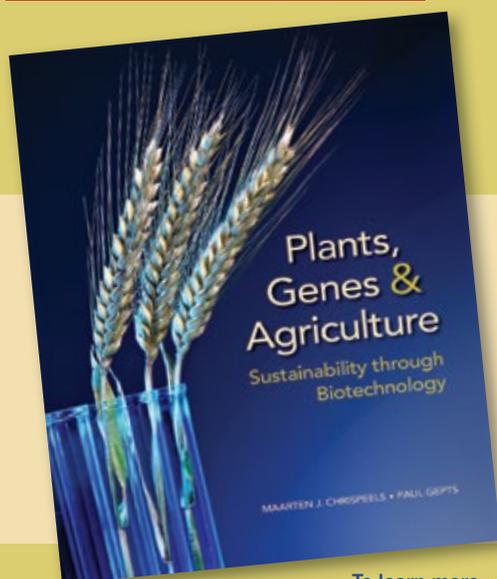
Since 2011, Leeann Thornton and Catharina Coenen have served as PUI representatives on ASPB's Membership Committee. There has been recent discussion among members of the PUI group about expanding PUI-associated activities and resources, with the hope of establishing a community through ASPB that supports and engages PUI-affiliated members

on an ongoing basis. A key part of this effort was to establish a new, PUI-focused section of ASPB, a decision taken by the ASPB Board of Directors in November.

The PUI section will provide a professional home for plant scientists interested in or associated with PUIs and a structure through which PUI-focused activities can be initiated and coordinated. The section will support individuals at all career levels by providing a conduit for

*continued on page 11*

**NEW, FOR MAJORS AND  
NON-MAJORS ALIKE!**



## Plants, Genes and Agriculture: Sustainability through Biotechnology

Edited by Maarten J. Chrispeels and Paul Gepts

What needs to happen if we are going to feed almost 10 billion people by the year 2050 in a sustainable way? Written for first- and second-year students, this interdisciplinary textbook addresses this challenging question, presenting biological, economic, and sociocultural issues at an introductory level.

### DISTINCTIVE FEATURES

- Contributors include 19 outstanding academic scientists, experts in their respective fields.
- All chapters were developmentally edited and evaluated for coverage and accuracy.
- Clear, colorful illustrations, including many photographs, complement the text.
- Definitions of unique terms and usage appear in the text margins and glossary.
- Chapter-ending questions and topics, Web links, and other sources provide opportunities for further research.

### FORMATS AND PRICING

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# Winning Entries of Recent Plantae Competitions

## Haiku, Photo Caption, and Why Study Plants?

BY MARY WILLIAMS

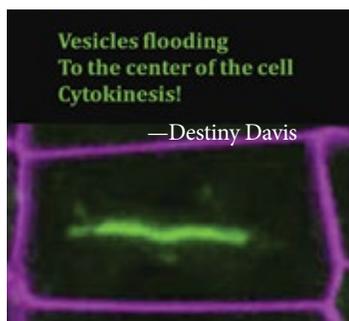
Features Editor, *The Plant Cell*

Community.plantae.org is a site for sharing, commenting on, and discussing plant science and plant science careers. To help introduce users to the versatility of the site, we are running a series of monthly fun competitions. Here are the winners from our most recent competitions.

### Haiku

The September Plantae competition asked plant scientists to write and submit haiku (short, three-line poems) about plant science. With more than 100 submissions, the judges struggled to make their decision. Most of the submissions embodied the spirit of the haiku form, many were lovely, nearly all expressed the author's fascination with plants and plant science, and some made us laugh out loud!

In the end, the judges selected a haiku submitted by Destiny Davis, a graduate student at the University of California, Davis, who works on cell plate formation during cell division (cytokinesis). Her winning haiku describes the vesicle movement toward the cell center that characterizes cell division in plant cells. Here, we've illustrated her haiku with an image extracted from a paper she coauthored, "Endosidin 7 Specifically Arrests Late Cytokinesis and Inhibits Callose Biosynthesis, Revealing Distinct Trafficking Events During Cell Plate Maturation" (E. Park et al., 2014, *Plant Physiology* 165: 1019–1034).



Haiku contest winner.

### More of our favorite submissions:

*The ion channel  
Is mechanosensitive  
And so beautiful*  
—Elizabeth Haswell

*Plant development  
How do hormones control you?  
Reveal yourself soon*  
—Aaron Rashotte

*O<sub>2</sub>, CO<sub>2</sub>?  
Either will bind; which to choose?  
OK, concentrate . . .*  
—Nan Eckardt

*A happy plant cell,  
unwary of invaders.  
Ouch! Haustoria!*  
—Philip Carella

*Helping scientists  
publish the best of their best—  
that is peer review.*  
—Ashton Wolf

*Adventitious you are called  
As if not important  
The brightest roots of all*  
—Jesús María Vielba



Photo caption contest winner.

### Photo Caption

In October, we had a photo caption competition (<https://tinyurl.com/y7ll7mpx>). Here's the winning entry:

*This will do nothing for insect-plant relations.*  
—Mike Page, Lancaster University

### There was a three-way tie for runner-up:

*Wise flies say, only fools rush in . . .  
but I can't help falling in love with  
. . . plants.*  
—Andika Ganadi

*Fly, you fools!*  
—Susan Cato

*If you're hungry and you know it,  
clap your leaves!*  
—Marco Giovanetti

### Why Study Plants?

November's competition was to tell us, in 140 characters or fewer, "Why study plants?" Here's the winning entry:

*Food, fiber, energy, medicine, ecology,  
home to countless animals, and  
beautiful at the same time. Drops  
mic . . . my work is done here.*  
—Paul Twigg, University of Nebraska

### The following received honorable mentions:

*Why study plants? They are the medium we exist in. Plants are inherently fascinating and define our lives.*

—Ian Street

*We need plants. Plants do not need us. So we need to study plants.*

—Edna Antony

*Because PLANTS represents "Photosynthesis Loving And Novel Thought-provoking System": much more exciting than animals to understand biology*

—Amey Redkar

*Plants are simply amazingly cool organisms that are all around us, yet still have a lot of mysteries as to how they function. Studying them lets us reveal the unknown.*

—Aaron Rashotte

*Food, fuel, fibers, and medicines: who's gonna give us all of these valuable things if plants don't exist?*

—Mohamed El Mazlouzi

**Visit community.plantae.org to see or participate in the competitions. ■**

# Pathways Not Pipelines

## Reflections on a Plant Science Research Network Workshop from an Early Career Scientist

BY NICOLE FORRESTER  
University of Pittsburgh

It was a quiet morning in August. I sat in my apartment, sipping coffee and sifting through emails. “We are seeking early career scientists . . . who are eager to participate in a facilitated ‘visioning’ exercise on the future of plant science training.” Uncertain, but intrigued by what the experience would entail, I submitted an application. A week later I was accepted to the Plant Science Research Network (PSRN) Workshop to Improve Training in the Plant Sciences.

The workshop was held September 19–21, 2017, at a hotel in Baltimore, Maryland. I arrived late in the afternoon on the first day, unpacked my belongings, and wandered down to Ballroom C. A welcoming mix of organizers and attendees were conversing about travel and research interests. I was amazed by the diversity of institutions, plant science backgrounds, and career goals present among just 30 individuals.

David Stern kicked off the meeting and introduced other members of the PSRN leadership team: Crispin Taylor, Vanessa Greenlee, and Natalie Henkhaus. Then he introduced two “provocateurs” who inspired us to push the boundaries of our thinking. Through these discussions, the room transformed into an open, accepting space where we could create, synthesize, and challenge each other’s ideas.



Nicole Forrester (center) listening to attendees present at the Plant Science Research Network Workshop to Improve Training in the Plant Sciences.

After a full night of sleep and a hearty breakfast, I was eager to return to the ballroom and begin generating ways to improve training in plant science. I found a seat among a semicircle of scientists and was introduced to Susan Sticklely, the strategic planning facilitator. Before the workshop, we were asked to read *Imagining Science in 2035* (<http://bit.ly/ImaginingScience>), a document that describes four scenarios of plant science research in the future. The divergent scenarios were created using two critical uncertainties: the primary driver of plant science research and the research environment.

Susan provided an overview of the scenarios and then separated

us into groups, each tasked with dissecting one of the four scenarios. I was part of a team exploring Critical Science, a scenario in which the “world [is] driven by increasing vulnerabilities to environmental stresses, which in turn foment geopolitical instabilities and conflicts.” Within this scenario, we considered the numerous challenges and opportunities surrounding training in the plant sciences. We then shaped these challenges into specific recommendations for enhancing training programs for early career plant scientists.

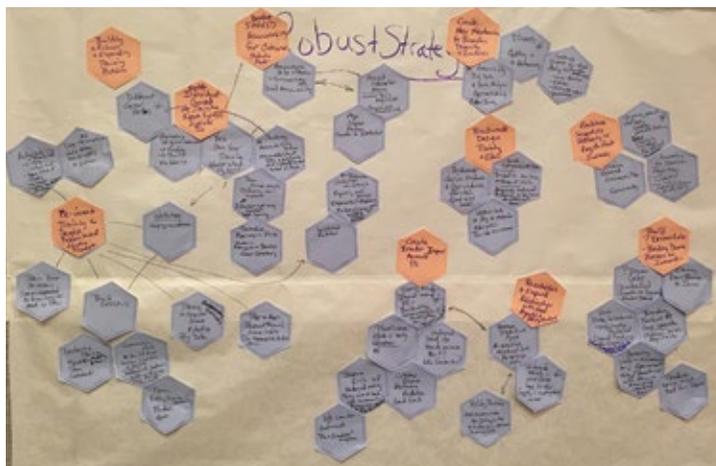
After diving into the scenarios, we reconvened to share our challenges, opportunities, and recommendations with the goal of

identifying robust strategies for training. With a jumbo sharpie and a handful of sticky notes, Susan began transcribing our recommendations and posting them on a sheet of paper covering the wall. The notes were clustered according to key themes, including trainee independence, flexible learning, and public engagement. We were left with a network of beehives that captured our ideas. Enthusiastic about our progress, but with weary brains, we wrapped up for the day.

The next morning, we settled into the ballroom and reflected on our experiences the previous day. One pattern that emerged within all the future scenarios was that plant scientists need to be trained

for diverse career paths. This necessity is equally relevant in the present. The energy in the room began to rise as we discussed our personal training experiences and concerns about the job market for academic scientists. Susan sensed the tension and converted our energy into an activity called “open space.”

We began by stating something we were passionate about regarding training in the plant sciences. Individuals with similar passions joined together in small groups and developed pilot programs based on their passions. I was passionate about changing the narrative between scientists and the public, so I joined several other trainees invested in science communication. We outlined an online video lecture series created by scientists, journalists, and communicators. Other groups designed a website for plant scientists to explore diverse career paths and a conference to bolster connections between industry



*After diving into the scenarios, groups reported their recommendations and recorded them on sticky notes clustered according to key themes, leaving a network of beehives and a robust strategy for moving forward.*

and academia. By the end of the activity, we had seven ideas for pilot programs. Instead of feeling stuck along the academic pipeline, we paved divergent paths forward.

The strategies and pilot programs developed during the PSRN workshop generated a

sense of optimism and excitement about the future of training in the plant sciences. A draft of the executive summary of our strategies has been shared with NSF, and several of the pilot programs are being pushed forward in collaboration with the PSRN, Plantae, and ASPB.

Although I'm inspired by the outcomes of the workshop, my optimism about the future of training in the plant sciences stems from my experience participating in the workshop itself. I had the opportunity to meet plant scientists from all career stages, each defined by their unique backgrounds, experiences, and goals. The workshop organizers cultivated an environment in which our stories were welcomed without judgment and our ideas were pushed beyond traditional boundaries. Our recommendations were considered valuable contributions to the development of novel training programs within plant science. Although the workshop was only three days, the participants, ideas, and overall experience will have a lasting impact on my path forward as a plant scientist.

Connect with the PSRN on Plantae to learn more about the training recommendations (<http://bit.ly/2CIkyFt>). ■

## **NEW SECTION FOR PUIs** *continued from page 8*

information regarding all aspects of a PUI career (e.g., preparing for and applying for a PUI faculty position, effectively implementing an undergraduate research program, developing teaching tools, navigating tenure and promotion). With the support of

ASPB and its resources, the new PUI section will help address challenges in these institutions unique to plant biology while also placing a strong emphasis on career development. These unique aspects are expected to attract new members to the Society.

The dedicated list of those who put in the extensive effort to get the PUI section approved

includes (but is not limited to) Catharina Coenen, Jill Deikman, Derek Gingerich, Maryann Herman, Karen Hicks, Bryan Thines, Harry Klee, Robert Last, and Leeann Thornton. This group thanks the ASPB Council and Board of Directors for their support in approving the petition signed by 214 ASPB members to create this new section.

If you are a member of a PUI community, are interested in PUIs, or simply wish to support ASPB's outreach to this part of the plant biology community, please consider becoming a member of this new section. You can learn more about it and join online at <http://my.aspb.org/join-sections>. ■

# Joanne Chory Wins 2018 Breakthrough Prize in Life Science

BY TYRONE SPADY

Director of Legislative and Public Affairs

Joanne Chory, a longtime ASPB member and professor and director of the Plant Molecular and Cellular Biology Laboratory, Howard Hughes Medical Institute investigator, and Howard H. and Maryam R. Newman Chair in Plant Biology at the Salk Institute for Biological Studies, has been named a recipient of the prestigious 2018 Breakthrough Prize in Life Science. This prize honors transformative advances toward understanding living systems and extending human life. Joanne is recognized for discovering how plants optimize their growth, development, and cellular structure to transform sunlight into chemical energy.

Joanne has long been a prominent member of the ASPB community. From 1998 to 2003, she served on the editorial board



Joanne Chory

of *Plant Physiology*. In addition, she has served on the Charles Albert Shull Award Committee (1995–1997) and on the Stephen Hales Prize Committee as both a member (1999–2001) and chair (2001–2003). Joanne also holds

the distinction of being among the first to support *The Plant Cell* by publishing in the inaugural volume (<http://www.plantcell.org/content/1/9/867>). In addition, she has trained more than 100 graduate students and postdocs and mentored countless others.

Thanks to an illustrious career, Joanne has received numerous honors. In 1995, before joining its award committee, she was a winner of the Charles Albert Shull Award, which was established in 1971 as a monetary award to recognize outstanding work in the field of plant biology by an ASPB member who is generally under the age of 45 or within 10 years of receiving his or her doctoral degree. She is also a member of the U.S. National Academy of Sciences (1999) and the American Academy of Arts and Sciences (1998).

The Breakthrough Prizes were established in 2013 and are sponsored by Sergey Brin, Priscilla Chan and Mark Zuckerberg, Pony Ma, Yuri and Julia Milner, and Anne Wojcicki. In addition to the life science prize (up to five per year), prizes are also awarded in the fields of fundamental physics (up to one per year) and mathematics (up to one per year). A total of \$22 million in prizes will be awarded across the 2018 Breakthrough Prize winners and other associated awards. Breakthrough Prize recipients receive up to \$3 million, the largest monetary prize in science. The prize has been given to both individual and joint recipients; Joanne is an individual recipient.

Please join us in congratulating Joanne! ■

# ASPB Members Elected to 2017 Class of AAAS Fellows

**S**eventeen members of the ASPB community were elected to the 2017 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

advancement of science or its applications [that] are scientifically or socially distinguished.”

New fellows will be honored at the 2018 AAAS annual meeting in February with a certificate and a blue and gold rosette to symbolize their distinguished achievements.

Nominations for the 2018 class are open until April 11, 2018. Please view the nominating procedures at <http://www.aaas.org/current-nomination-cycle>.

Congratulations to the following ASPB members. ■



**Alice Barkan**  
*University of Oregon*



**Janet Braam**  
*Rice University*



**David M. Braun**  
*University of Missouri*



**Wesley B. Bruce**  
*BASF Plant Science*



**Roger T. Chetelat**  
*University of California, Davis*



**Sean R. Cutler**  
*University of California, Riverside*



**David W. Emerich**  
*University of Missouri*



**Arthur G. Hunt**  
*University of Kentucky*



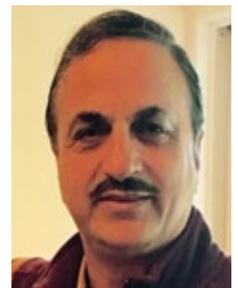
**Toni M. Kutchan**  
*Donald Danforth Plant Science Center*



**James H. Leebens-Mack**  
*University of Georgia*



**E. Neil G. Marsh**  
*University of Michigan*



**Autar K. Mattoo**  
*USDA Agricultural Research Service*



**Thomas Mitchell-Olds**  
*Duke University*



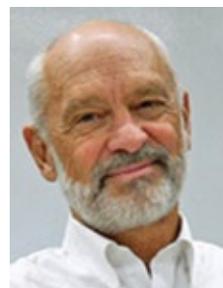
**Wayne Allen Parrott**  
*University of Georgia*



**J. Chris Pires**  
*University of Missouri*



**Chung-Jui Tsai**  
*University of Georgia*



**Thomas H. Turpen**  
*Technology Innovation Group*

## Dirk Inzé Receives 2017 World Agriculture Prize

**A**SPB member Dirk Inzé of the VIB–Ghent University Center for Plant Systems Biology (PSB) received the 2017 World Agriculture Prize, awarded annually by the Global Confederation of Higher Education Associations for Agricultural and Life Sciences (GCHERA). The World Agriculture Prize recognizes exceptional lifetime achievement by researchers in the agricultural and life sciences. The prize aims to encourage global development of the mission of higher education institutions in education, research, and innovation in the agricultural and life sciences by recognizing the distinguished contribution of an individual to this mission.

Dirk's pioneering work in the 1980s and early 1990s on cell cycle regulation in plants earned him the Körber European Science Prize (Germany) in 1994 and the Francqui Prize (Belgium) in 2005. In 2010 he received the FWO



*Dirk Inzé (right) was awarded the 2017 GCHERA World Agriculture Prize at a ceremony at Nanjing Agricultural University. He was presented with a certificate by John Kennelly, president of GCHERA.*

Excellence Prize, awarded every five years by the principal research funding agency in Belgium to an eminent Flemish researcher.

In 1998, Dirk cofounded the spin-off company CropDesign together with the Tech Transfer

Offices of VIB and Ghent University. Dirk was appointed science director of PSB in 2002. Under his directorship, PSB was transformed into one of the world's leading centers of work on plant development and responses

to abiotic stresses. His group of some 30 researchers is well supported by various large grants, including a European Research Council Advanced Grant.

In recent years, Dirk has made numerous outstanding contributions to the molecular understanding of plant growth. His research has opened new perspectives for developing high-yielding, climate-resilient crops.

"I am very honored to receive the prestigious World Agriculture Prize," Dirk noted. "It is a great motivator to further bring basic plant research toward field applications." He was awarded the prize on October 28, 2017, during the ninth GCHERA World Conference at the Nanjing Agricultural University in China. The prize of \$50,000 was sponsored by the Education Development Foundation of Nanjing Agricultural University and Da Bei Nong Group. ■



Call for Papers

*Plant Physiology*® Focus Issue on Biotic Stress

Deadline for submission: August 1, 2018

For more information, go to <https://aspb.org/ppfocus/>.

## Kranthi Mandadi Receives New Innovator in Food and Agriculture Research Award



*Kranthi Mandadi*

**A**SPB member Kranthi Mandadi of Texas A&M University has received the Foundation for Food and Agriculture Research's 2017 New Innovator in Food and Agriculture Research award. Kranthi is working to improve plant efficiency by developing and using a method for high-throughput screening of anti-microbial genes and molecules effective against fastidious (or unculturable) pathogens, such as those causing citrus greening and potato zebra chip diseases. With

the support of industry partners, the research findings will be translated into disease management strategies in the field to help growers combat billions of dollars in annual losses.

Kranthi is an active member of ASPB, having served as a postdoc ambassador (2011–2014) and on the Membership Committee (2012–2014). He currently is a member of the International Committee (2016–2019).

The New Innovator in Food and Agriculture Research Award was designed to provide the early

investment needed to launch new faculty members into successful scientific careers in food and agriculture. Investing a substantial amount in faculty members within the first three years of their career allows them to pursue innovative and transformational ideas uninhibited by the pressure of identifying their next grant. See [foundationfar.org/new-innovator/kranthi-mandadi/](http://foundationfar.org/new-innovator/kranthi-mandadi/). ■

## Thomas Girke Awarded Natasha V. Raikhel Award in Research Innovation and Science Leadership



*Thomas Girke and Natasha Raikhel*

**T**he Institute for Integrative Genome Biology at the University of California, Riverside (UCR), awarded its inaugural Natasha V. Raikhel Award in Research Innovation and Science Leadership to Thomas Girke, professor of bioinformatics and director of UCR's High Performance Computing Center.

Announced during the Center for Plant Cell Biology's 15th Annual Symposium and Awards Ceremony on December 8, this award honors the legacy of previous center director Natasha Raikhel in recognizing Thomas's outstanding leadership in computational biology and the life sciences. Not only did Thomas

receive the great pleasure of having Natasha in attendance for this special commendation, but he was also heartily congratulated by Dame Caroline Dean OBE of the John Innes Centre, who served as the symposium's Distinguished Noel T. Keen Lecturer. ■

## ASPB Members Recognized as Honorary Doctors of Agricultural Science by Swedish University of Agricultural Sciences

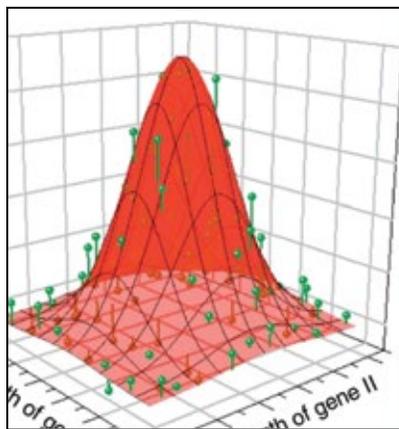
**A**SPB members Jonathan Jones from the Sainsbury Laboratory in Norwich, U. K., and Edgar B. Cahoon from the Center for Plant Science Innovation at the University of Nebraska–Lincoln were recognized as Honorary Doctors (*Hedersdoktors*) of Agricultural Science by the Swedish University of Agricultural Sciences (SLU) at the graduation ceremony on October 7, 2017. The honorary doctorates were awarded based on outstanding scientific accomplishments and contributions to SLU. Jonathan was appointed by the SLU Faculty of Natural Resources and Agricultural Sciences, and Ed was appointed

by the SLU Faculty of Landscape Architecture, Horticulture and Crop Production Science.

Jonathan and Ed received their degrees and traditional doctoral hats at the ceremony held at the Ultuna Campus in Uppsala, Sweden. The ceremony included recognition of four other honorary doctors and the awarding of doctoral and PhD degrees to about 75 students. Following the graduation ceremony, Jonathan and Ed participated in a 500-person dinner celebration at the Uppsala Castle with other graduates, administrators, and guests (<https://tinyurl.com/yqm3e8ln>). ■



From left: Patrik Alströmer, Alingsås; Erik Teske, Utrecht University; Catharine Ward Thompson, University of Edinburgh; ASPB member Edgar B. Cahoon, University of Nebraska–Lincoln; Lawrence R. Schaeffer, University of Guelph; and ASPB member Jonathan Jones, Sainsbury Laboratory. PHOTO CREDIT: JENNY SVENNÄS-GILLNER/SLU



Call for Papers

*Plant Physiology*<sup>®</sup>

Focus Issue on Synthetic Biology

Deadline for submission: September 1, 2018

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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](mailto: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.

## Keiko Torii

College of Arts and Sciences Endowed Distinguished Professor of Biology, University of Washington; Investigator, Howard Hughes Medical Institute and Gordon and Betty Moore Foundation; and Principal Investigator and Visiting Professor, Institute of Transformative Biomolecules, Nagoya University

BY DIWAKER TRIPATHI

ASPB Student Ambassador and Research Associate, Plant Biology Department, University of Washington, Seattle

**K**eiko Torii was born in Tokyo, Japan. She grew up in Yokohama, Japan, and Scarsdale, New York. She received her BS in biological sciences and MS and PhD in biochemistry and biophysics from the University of Tsukuba, Japan.

After completing her PhD, she received a Research Fellowship for Young Scientists from the Japan Society for the Promotion of Science and worked at the Molecular Genetics Research Laboratory, University of Tokyo. After two years, she moved to Yale University for a Brown Postdoctoral Fellowship in the Department of Molecular, Cellular and Developmental Biology. In 1997, she joined the University of Michigan to pursue a postdoc in the Department of Molecular, Cellular, and Developmental Biology.

Keiko joined the Department of Botany at the University of Washington as an assistant professor in 2000. Since then, she has



done research on plant development and signaling and was promoted to associate professor and then professor. Currently, she holds the title of Endowed Distinguished Professor of Biology at the College of Arts and Sciences.

Keiko has been one of 15 Plant Science Program investigators at the Howard Hughes Medical Institute–Gordon and Betty Moore Foundation (HHMI–GBMF) since 2011. Since 2013, she has also been

one of the three overseas principal investigators at the Institute of Transformative Biomolecules (ITbM) at Nagoya University, Japan. Her group studies how plant cells coordinate proliferation and differentiation during organ morphogenesis, with specific focus on stomatal development.

Keiko has received several awards in the United States and Japan, including the Fellow of ASPB award. She is chief editor of *The Arabidopsis Book* and has been an editor for *Plant Physiology* and *Annual Review of Plant Biology*. She has also served as president of the North American Arabidopsis Steering Committee. She was a featured scientist in the *Science* /L'Oréal Foundation booklet “Beating the Odds: Remarkable Women in Science” (<http://www.sciencemag.org/booklets/lor-al-women-science-2008-edition>). Keiko also received the 2015 Saruhashi Prize for Japanese women researchers in the natural sciences.

**What got you interested in plant biology in general, and what influences directed you to your specific area of research, plant signaling in development?**

I have always been really interested in biological systems. However, like many other young students, I was more interested in medical biology. I was not necessarily one of those people interested in plants from their college years. In the late 1980s, when I was a senior undergraduate and had to choose a thesis project, the T-DNA transfer technique was becoming popular. I became fascinated with the technique, showing that plants can be transformed to study their genetic basis.

Compared with animal sciences, I felt that plant biology back then was more physiology and observation based, and a lot of things could be discovered after manipulating plants at genetic levels to understand how they

*continued on page 18*

**KEIKO TORII**  
*continued from page 17*

function. Today I totally endorse the decision I made at that time to be a plant scientist.

I was genuinely interested in how beautiful patterns are produced in plants, how they change shape and form in different environmental conditions. The idea of cell–cell communication and signaling came out when I was doing my first postdoc at the University of Tokyo, where I was assigned to clone a quite famous mutation in the *ERECTA* gene in *Arabidopsis*, which is the basis of the erect inflorescence phenotype of the Landsberg *erecta* accession. My collaborators identified a new *erecta* allele from T-DNA insertion mutagenesis. I was the first in Japan to clone any developmental regulator gene from an *Arabidopsis* mutant by T-DNA tagging. It turned out to be the first receptor kinase regulating plant growth.

Now, receptor kinases are well-known regulators of plant growth, development, immunity, and interkingdom communication (e.g., symbiosis). Back then, there was a good amount of data about “conventional” plant hormones, but the idea of peptide hormones in plants was not well established. I was very excited by the nature of the type of encoded protein by *ERECTA* as it could give some idea of cell–cell communication in specifying plant shape. This research finding convinced me that understanding plant signaling in development would be an exciting and challenging field in the future. Later, we discovered that this receptor family plays a central role in the patterning and differentiation of stomata, and we were fortu-



*The first Torii Lab joint retreat. Members from Nagoya ITbM and HHMI/UW Seattle demonstrating stomatal movement.*

nate to be able to identify peptides and transcription factors specifying the beautiful and essential cellular structure of land plants.

**Who influenced your scientific thinking early in your career, and how?**

This is kind of a difficult question. One thing that really nurtured me was the environment surrounding me when I was a postdoc in the Molecular Genetics Research Laboratory at the University of Tokyo. In retrospect, it was a very revolutionary environment because in a small, open office and lab, groups were working on *Drosophila*, *Schizosaccharomyces pombe*, and *Arabidopsis*. In my PhD, I was trained as a plant tissue-culture person, but I wanted to know the mechanisms behind the developmental processes. I did not know much about genetics and pathway analyses. However, in my short stay in Tokyo, I learned all these concepts and techniques with the help of people in diverse labs. Thanks to them, now people think that I am a well-trained geneticist.

As for a specific person, I think Joanne Chory is definitely the one

who influenced me most. In the early 1990s, her group was publishing mind-blowing papers using small *Arabidopsis* and a simple phenotypic screening—it was not technically super challenging, but rather their approach to designing experiments and screening for something that nobody had seen before. I was fascinated by the idea that one is able to see what is virtually unknown. It was also very encouraging for me to see an active, talented woman scientist leading the field.

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

When I received the Saruhashi Prize in 2015, many people asked me that question. I mentioned earlier that I was fortunate to be assigned to clone *ERECTA* and find a receptor kinase. I gave a talk at an international conference in Amsterdam in the early 1990s, and at that time, people who studied plant immunity had started cloning pattern recognition receptors and resistant proteins that have leucine-rich repeats or

receptor kinases. People got super excited to see an unknown young Asian woman giving a surprising talk. They wanted to discuss with me the roles of receptor kinases in plants and a commonality of the signaling pathways controlling development and immunity.

Back then, I was not sure if I wanted to pursue academia or work in industry. Unfortunately, I did not have any job offers in Japan. To pursue my career in academia, I needed to find a position in a foreign country. Fortunately, I was able to convince Dr. Xing-Wang Deng at Yale University to support me for six months. That was an exciting opportunity, and so I decided to come to the United States. In retrospect, it took a lot of courage to come to the United States (and Dr. Deng, my mentor, was very brave to offer a position to a foreign researcher without a publication record).

After that, I received additional fellowships to continue my postdoctoral training to study photomorphogenesis. When I got an independent position at the University of Washington, Seattle, I decided to work on receptor kinase signaling in plant development to establish my own field.

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

This is a very difficult question. I, too, think there is still a bias against women. In plant biology, so many successful woman scientists, such as Joanne Chory, Natasha Raikhel, and Vicki Chandler, among many others, became role models to junior women scientists, including myself, and have taken away some of the bias. I think plant biology

is an amazing discipline with very few barriers for women scientists. However, if you talk about university politics and other things, I think there is quite a bias, maybe against women or foreign faculty members. I feel there is still a barrier for women in academia being nominated for awards and investigatorships, being selected as head principal investigator (PI) in multi-PI grants, and being encouraged to take leadership positions. So there are different levels to fight.

On the practical side, any woman can face maternity leave and child care and other family obligations. Everybody recognizes these issues, especially during graduate student and postdoc years, and each woman scientist needs specific supports to achieve her career goals. There is a lot of room for improvement both in the system (e.g., clear policy for paid maternity leave, halting of the clock for graduate and postdoctoral training grants, securing of child care) and in people's perspectives (e.g., the PI, family members, social pressure, and so forth surrounding women scientists undergoing family transitions).

#### **How do you convince medical scientists about the importance of plant science?**

In 2011, I became an HHMI-GBMF investigator, and since then I have had opportunities to present talks to diverse scientists in biomedical fields. I consciously appeal to those scientists to consider the importance of plant biology. These opportunities have also shaped me to think about plant biology research in a bigger context. For example, the plant is an attractive system to study patterning because two- and three-

dimensional patterning occurs without cell movement. It is also an excellent system for genetics.

In addition, I emphasize how plant development studies can have broader implications for animal science, on top of plants' importance in our food security and environment. I wrote a grant with my Japanese colleagues at ITbM on synthetic chemicals that can be used to manipulate plant development and signaling. It is very interesting to integrate chemical approaches to plant biology. I guess I grow as if I was planted; interaction with chemists really gave me a new way of thinking.

#### **What journals do you regularly follow?**

I follow journals like *The Plant Cell*, *Development*, *Developmental Cells*, *eLIFE*, and others. Nowadays, a lot of researchers and students are communicating via Twitter. I started interacting on social media, and I believe it can serve as a powerful tool for communication between scientists and the public. Whenever I find an interesting paper, I try to communicate it through social media. *Plantae* is a great tool for scientists, postdocs, and students to share their ideas and opinions. Compared with traditional research forums, I think social media allows more junior scientists to promote their exciting new work and fellow lab members.

#### **What are the challenges you face in managing two different labs in two different countries?**

People in my labs do have some complaints about my availability. I am a hands-on PI and like to do benchwork sometimes. I sometimes help my labs in molecular

cloning and microscopy. Having multiple and bigger labs limits my time for experiments and interactions with lab members. I still want to do my hands-on work to keep inspired and motivated. Having less time for people in my lab is a challenge. Another challenge is traveling back and forth; that keeps me fit!

#### **As an employer, what are the five key qualities you look for in a potential team member?**

Great question! You have to be curious and driven to learn new things and address new questions. You also need to be open-minded to accept unexpected results, something you are not prepared for. I believe that exciting new breakthroughs often come from something out of the box (although it is really difficult to come up with a new hypothesis from unexpected, disappointing results). I prefer a person with solid hands so that he or she can reproduce experimental results. There should be a balance between vision and skills.

You ought to be critical of your own results and of your boss. It is not always right to agree with authorities. Keep challenging yourself (and your boss, of course), and be critical in your research approach. A person needs to be driven to succeed and willing to go beyond his or her comfort zone at any time. Also, interacting with other scientists is critical to get new ideas.

I do not necessarily want all these qualities in a person when he or she is hired, but I expect my lab members to grow these qualities later in their career through my lab. Well, I have to continuously learn to be a better mentor, too!

#### **What advice would you give educators to encourage young people to explore science and plant biology?**

That is always a challenge I have, as most undergraduates in my lab are premed or pre-health sciences. I strive to be a very influential person to inspire people to pursue plant science. To convince people about the importance of plant science, I tell them that in molecular biology, all the major paradigm shifts were made from plant research. For example, the first cell was discovered by Robert Hooke. Other examples are Mendel's law of inheritance, the first virus, the first transposons (Barbara McClintock), and RNAi phenomena—they were all discovered in plants first.

Plants are very amenable to work with compared with animals for people with any background and training. Plant science is also important for agriculture and the environment. Any medical student can get broader ideas from the molecular biology of plants to shape a career in the medical field.

#### **If you were able to repeat your years as a graduate or post-graduate student, would you do anything differently?**

I must say, I should have learned more math, statistics, and computer programming. Some people say they're too old to do these. That is not true. I do some programming myself, slowly learning step by step. Now, if I were a graduate student, I would definitely want to learn more bioinformatics and biostatistics. These quantitative skills are, in

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**KEIKO TORII**  
*continued from page 19*

a way, your weapons to model, predict, and analyze your data and take advantage of the publicly available big data sets. With a good imagination and many different quantitative tools, we can address the biological questions better.

**Based on your experience, can you rank your interest in five areas of your career?**

I would say, (1) teaching, (2) doing outreach, (3) writing grants, (4) mentoring in a lab, and (5) review-

ing others' work. It's really difficult to rank them; I think all these activities are important. Some of them I feel obligated to do, whereas some I like to do. I always feel I should do something for both older and younger generations, such as reviewing and mentoring.

**What keeps you inspired to continue in science?**

I definitely like to look at the patterns in plant cells and tissues. A microscope image of plant epidermis or just a plant cell keeps me inspired. Whenever something does not work in the lab or in the office, or whenever

I have a terrible day at a faculty meeting, I just look at plant cell pictures under a confocal microscope, and it calms me down and motivates me to do research with more enthusiasm.

**If you had six months off, what would you do with your time?**

**Any hobbies?**

The other day, I was looking at my high school yearbook. Everyone thought I would be an artist or musician, as I was very active in music (both choir and orchestra) and art (illustration). No one at that time predicted that I would be a scientist (It's funny to see that

my friends back then commented in my yearbook, "If you become an artist, give us an autograph!"). So you don't know what you'll end up with. I already have given up music. However, sometimes I feel I would like to start doing paintings again. Maybe one day I will make illustrations for journal covers! ■

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## Biochemistry & Molecular Biology of Plants

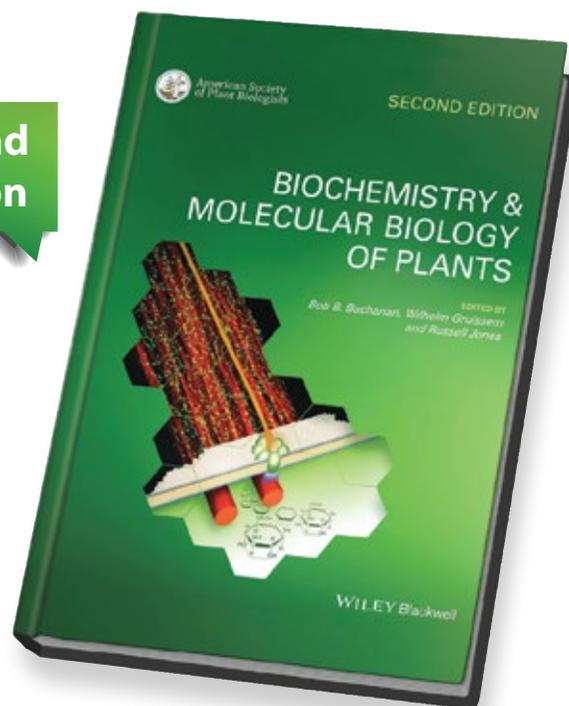
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## Policy Update

BY LAUREN BROCCOLI  
Lewis-Burke Associates, LLC

### Appropriations Update: Fiscal Year 2018

On December 7, Congress passed another short-term stopgap funding measure to fund the government under the fiscal year (FY) 2017 levels until December 22. Although the House of Representatives passed all 12 of its FY2018 bills and the Senate has approved its version of both the Agriculture Committee and Commerce, Justice, Science, and Related Agencies bills through committee, Congress must negotiate a bipartisan budget agreement to move forward on a final FY2018 spending package. This requires addressing the current law governing spending caps for defense and nondefense discretionary programs.

Democrats continue to insist on parity between defense and nondefense discretionary spending, whereas most Republicans would like an increase for defense only. President Trump met with Majority Leader Mitch McConnell, Speaker Paul Ryan, and Minority Leaders Chuck Schumer and Nancy Pelosi to discuss spending, but no final deal was reached at the time of this writing. There are complicating factors, including the debt ceiling and amnesty for Dreamers, that will also affect these negotiations.

Looking ahead, it's likely that Congress will need to pass an additional continuing resolution at the end of December. This continuing resolution will likely

extend into January because it's expected to take more than two weeks to negotiate a budget deal and a final omnibus.

### House and Senate Pass Versions of Tax Reform, Bill Heads to Conference

On November 16, the House of Representatives passed the Tax Cuts and Jobs Act, and the Senate followed on December 2, passing its version of the tax reform bill. The bills now head to conference to iron out significant differences between them. Conferees will look to craft a package that can pass both chambers, meaning that provisions of both the House and Senate versions are in play. At the time of this writing, congressional leaders were striving to get the conference and final bill completed before Christmas.

Provisions in both the House and Senate bills that would significantly impact institutions of higher education and other tax-exempt nonprofits involve changes to education benefits and credits and charitable contributions.

#### Education Benefits and Credits

**Where they differ:** The House bill proposes the elimination of the Hope Scholarship and Lifetime Learning Credits and would create a modified American Opportunity Tax Credit. The House version would also eliminate Section 117(d), which allows institutions to provide tuition reduction or waivers to employees and their dependents and, under

117(d)(5), to graduate students. This change would create a new tax liability for institutions and students. It would also eliminate Section 127, which allows tax-free treatment of employer-provided education assistance.

The Senate version maintains the deduction for student loan interest and does not make changes to student education tax credits. Both bills would expand Section 529 college savings accounts to cover K-12 expenses of up to \$10,000 per year. Additionally, the Senate proposal would allow savings to be used for dual enrollment in an institution of higher education. Significantly, the Senate version maintains workforce educational benefits eliminated in the House proposal, including those in Section 117(d) and Section 127.

**Main impacts:** The House version would harm part-time students, graduate students, and lifetime learners. It would create a new tax on many graduate students, in some cases doubling their tax liability. Students would also lose the ability to deduct student loan interest payments. The Senate version maintains many of the current education benefits and is significantly preferable to the House version.

#### Charitable Contributions

**Where they differ:** Although both versions propose expanding the standard deduction, the House version would expand the deduction to \$12,200 for individuals

and \$24,400 for married couples filing jointly. The Senate version expands the deduction to \$12,000 and \$24,000, respectively. The House version expands the exemption for the estate tax but would eventually phase it out completely. Although the Senate version expands the estate tax exemption, it maintains the tax. The ability to deduct 80% of the amount paid for the right to purchase tickets for athletic events is eliminated in both bills. Both versions also increase the limit on cash contributions to qualified organizations from 50% to 60% of taxable income.

**Main impacts:** The congressional Joint Committee on Taxation has estimated that as a result of these changes, the number of filers claiming the charitable deduction will drop from roughly 40 million to 9 million. This will lead to an estimated \$100 billion less in charitable giving over the next decade.

### President's Nominee for USDA Undersecretary for Research, Education, and Economics Withdraws

On November 2, President Trump's nominee for USDA undersecretary for Research, Education, and Economics, Sam Clovis, quietly withdrew from the nomination process. Clovis, who was a member of the Trump campaign and transition team, withdrew after reports that he was aware of Trump campaign

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**POLICY UPDATE***continued from page 21*

foreign policy adviser George Papadopoulos's efforts to form a relationship with Russian officials.

Clovis has been one of the more controversial nominees because of his lack of scientific credentials, his denial of climate change, and controversial comments related to race he made before his nomination. The undersecretary serves as chief scientist and oversees the National Institute of Food and Agriculture and the ARS. President Trump has not yet announced a new nominee for the position. Chavonda Jacobs-Young, administrator of ARS, is currently serving as acting undersecretary.

*Source and Additional Information*

- An article on Clovis's withdrawal is available at <https://tinyurl.com/yctw85qn>.

### White House Releases National Climate Assessment Reports

On November 3, the U.S. Global Change Research Program (USGCRP) released Volumes I and II of the Fourth National Climate Assessment, a quadrennial report mandated by the Global Change Research Act of 1990. The USGCRP involves 13 federal research agencies and develops reports with input from academia on U.S. weather and climate.

The scientific findings of this report contradict other Trump administration climate policies, such as efforts to remove the United States from the Paris Agreement and roll back Clean Power Plan regulations.

Members of the public may submit comments on this

report by January 31, 2018. A National Academies of Sciences, Engineering, and Medicine committee will be providing feedback before the final report is published, likely in December 2018.

*Source and Additional Information*

- The Climate Science Special Report is available at <https://tinyurl.com/y88kn7bq>.

### Letter from Senate Democrats Encourages White House to Appoint Science Adviser

On November 16, Democratic members of the Senate's Commerce, Science, and Transportation Committee wrote to President Trump encouraging him to nominate well-qualified experts to key positions within the White House Office of Science and Technology Policy (OSTP).

President Trump has yet to name a science adviser, making this the "longest post-election period without a nominee for science adviser since 1976, when President Ford signed legislation formally creating OSTP." He has also failed to respond to the senators' previous letter in April urging support for OSTP. In March, Trump appointed Michael Kratsios as deputy chief technology officer. No further appointments to OSTP have been made since.

In the letter, Democrats identified specific situations in which President Trump might have benefited from having input from Senate-confirmed technical and scientific experts, and they urged the president to nominate well-qualified individuals to vacant OSTP posts. Signatories of the letter include Senators Maggie

Hassan (D-NH), Bill Nelson (D-FL), Ed Markey (D-MA), Gary Peters (D-MI), Tom Udall (D-NM), Cory Booker (D-NJ), and Catherine Cortez Masto (D-NV).

*Source and Additional Information*

- The letter is available at <https://tinyurl.com/y9d6nhel>.

### NSF Biological Sciences Directorate Eliminates Deadlines for Full Proposals

On October 5, NSF released a Dear Colleague Letter announcing that the Directorate for Biological Sciences (BIO) would be making significant changes to their grant application process for the 2018 calendar year. Effective January 1, 2018, BIO will move to a no-deadline policy to promote interdisciplinary research.

The new policy means that core programs under the Division of Environmental Biology and the Integrative Organismal Systems Division will no longer be requesting preliminary proposals. However, awards for the 2017 solicitations will be distributed based on the deadlines provided in each solicitation. Each division will then release new solicitations in 2018 incorporating the new policy. Solicitations for core division programs will be listed as archived on the NSF BIO website in anticipation of the new solicitations, not because the programs are being terminated.

*Source and Additional Information*

- The NSF Dear Colleague Letter is available at <https://tinyurl.com/yarublt7>.

### National Academies Outlines 2025 Vision to Improve USDA Data Collection

On October 11, the National Academies of Sciences, Engineering, and Medicine published *Improving Crop Estimates by Integrating Multiple Data Sources*, a report that explores avenues for the National Agriculture Statistics Service (NASS) to produce more accurate estimates of acreage for agriculture production, yield, and cash rents for major crops at the county level. The vision for 2025 includes the following three components: (1) implementation of a transparent and well-documented process for developing and publishing estimates, (2) creation of a "georeferenced farm-level database," and (3) integration of data from a variety of sources to complement the data collected from NASS surveys.

To facilitate the implementation of these recommendations, the National Academies encouraged NASS to collaborate with the Risk Management Agency and the Farm Service Agency at USDA to develop a collaborative, comprehensive approach for this data integration plan. The suggested restructuring would not directly affect USDA grant recipients, and the long-term implications include more accurate, credible agricultural data from NASS.

*Source and Additional Information*

- The full National Academies report is available at <https://tinyurl.com/y9taxdrf>. ■

## Promoting Plant Biology Education at National Association of Biology Teachers 2017

BY VALERIE HAYWOOD  
Case Western Reserve University

The ASPB Education Committee hosted an Education and Outreach booth at the National Association of Biology Teachers (NABT) Professional Development Conference in St. Louis, Missouri, this past November in the historic Union Station Hotel. This year's booth was organized by ASPB education committee members Valerie Haywood and Scott Woody and by Winnie Nham, ASPB education coordinator.

This event was a grand success, mainly due to contributions from local ASPB member volunteers associated with Monsanto, the University of Missouri, and Washington University, as well as help from West Virginia State University (WVSU) faculty attending NABT. Our volunteers not only provided their individual expertise in plants, but also generously donated some excellent plant resources to showcase in the booth. Scott Saracco from Monsanto brought along cotton and soybean plants to display. Maria Sorkin, a graduate student from Washington University, provided resources to demonstrate DNA extraction from strawberries. Ivan Radin, also a graduate student at Wash U, supplied us with Arabidopsis and Nicotiana plants at various stages, including MS-plated Arabidopsis seedlings.

Many booth visitors commented that they had never seen cotton or soybean, plants commonly



*ASPB Education Committee member Valerie Haywood and Miguel Vega-Sanchez from Monsanto, standing behind cotton and soybean plants at the Education and Outreach booth.*



*The NABT 2017 exhibit hall in the ballroom of the historic Union Station Hotel in St. Louis, Missouri.*

used in many everyday products. Many teachers visiting our booth expressed interest in using plants in the classroom and found the small sizes of Arabidopsis

and Nicotiana very appealing. The biggest hit of all were the Arabidopsis seedlings grown on MS plates. Teachers loved this idea! Based on visitor responses

and enthusiasm, we plan to develop learning modules centered around using Arabidopsis in the K–12 classroom for future Education and Outreach events.

Feedback from teachers and administrators has made one thing very clear: our work at these outreach events is more important now than ever. Focus on plants in K–12 curricula is being reduced as greater emphasis is placed on animal systems and human health. And with budget cuts looming for the U.S. Department of Education, teachers are searching for inexpensive options to bring science into the classroom.

The ASPB Education Committee will be investigating ways to highlight the value of incorporating plant biology education into curricula, looking for ways to facilitate the use of plant models in science education and to educate the public about the importance of plants. Please feel free to share your thoughts on these ideas with the ASPB Education Committee. Contact Valerie Haywood at vxh20@case.edu if you have ideas you would like to share.

We offer special thanks to our volunteers for making our booth a success: Beverly Agtuca (University of Missouri), Debarati Basu (Wash U), Mark Chatfield (WVSU), Dustin Potts (Monsanto), Ivan Radin (Wash U), Scott Saracco (Monsanto), Maria Sorkin (Wash U), and Miguel Vega-Sanchez (Monsanto). ■

# Master Educator Program

## Request for Proposals 2018

**A** AAS, NSF, and other stakeholders called for transformation in undergraduate biology education in *Vision and Change in Undergraduate Biology Education: A Call to Action* (<http://visionandchange.org/finalreport/>). With support from NSF, ASPB gathered feedback from plant biologists on how to put the *Vision and Change* recommendations into

practice. A major concern that emerged is the need for instructional materials in plant biology that align with the recommendations.

To address these concerns, the ASPB Education Committee established the ASPB Master Educator Program (MEP). Open exclusively to ASPB members, MEP offers financial support to

successful applicants to participate in focused, substantive, and practical professional development with the aim of creating undergraduate plant biology instructional materials aligned with the recommendations of *Vision and Change* and ASPB's core concepts in plant biology (<http://www.aspb.org/education-outreach/higher-education/>).

MEP winners will receive up to \$3,500 (reimbursable or paid directly) for registration and travel to a professional development program and/or to the ASPB annual meeting to present instructional materials developed with MEP support. **Applications will be accepted through March 12, 2018 (11:59 ET).** Learn more and apply at <http://mep.aspb.org>. ■

## Plant BLOOME 2018

### Applications Now Being Accepted

In 1995, ASPB established the Plant Biology Learning Objectives, Outreach Materials, & Education (Plant BLOOME) grant with the goal to enhance public awareness and understanding of the essential roles of plants in all areas of life. Plant BLOOME 2018 is open to ASPB members who have developed 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:

- the importance of plants for the sustainable production of medicine, food, fibers, and fuels
- the critical role plants play in sustaining functional ecosystems in changing environments
- the 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
- the range of careers related to plant biology or available to plant biologists.

A maximum award of \$50,000 can be requested for the one-year funding cycle. Projects can begin any time after recipients are notified.

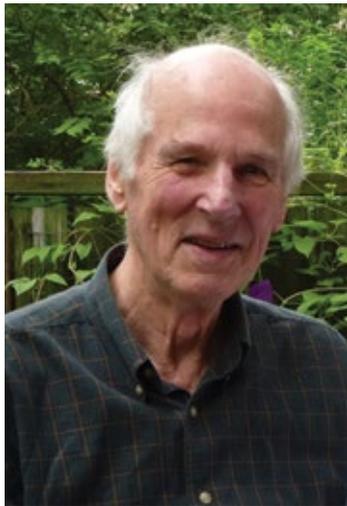
**Applications will be accepted through April 2, 2018 (11:59 ET).**

**Learn more and apply at <http://bloome.aspb.org>.**

This article first appeared on December 1, 2017, in KU News (<https://tinyurl.com/yd3lqmc6>). It is adapted here with permission from the University of Kansas.

## Rolf Borchert

1933–2017



**R**olf Borchert, professor emeritus at the University of Kansas (KU), died November 23 in Lawrence at age 84. “I am saddened to learn of the death of Rolf Borchert, a professor of plant physiology who worked for 34 years at KU and shared his love of learning with numerous students and colleagues,” said Chancellor Douglas A. Girod. “On behalf of the entire university, I offer my sincere condolences to his family, friends, and all who knew him during his time at KU.”

Rolf was a professor at KU from 1968 to 2002 and more recently a professor emeritus who

researched tree growth patterns and flowering periodicity in dry tropical forests. “Rolf was a highly accomplished plant biologist who helped us understand how trees time synchronous flowering in the tropics using subtle changes in light cues,” said Joy Ward, Dean’s Professor in Ecology and Evolutionary Biology and interim associate dean of science research. Among his most notable publications was an article in *Nature* describing how synchronous flowering among trees near the equator is controlled by subtle differences in photoperiod with respect to sunrise or sunset times.

“He was also a wonderful colleague and mentor who took time to help me think through my own research when I was a new faculty member,” Ward said. “I especially enjoyed traveling with him and his wife, Laura, in Costa Rica to conduct plant research.” Borchert led KU study abroad programs in Costa Rica and in his native Germany.

“Rolf lived life to the fullest and was a great example of how to balance research and family,” Ward said. “He will be greatly missed.” ■

## Theophanes Solomos

1929–2017

BY MARK TUCKER, ANGELOS KANELIS, DINGBO ZHOU, AND PANAGIOTIS (PANOS) KALAITZIS

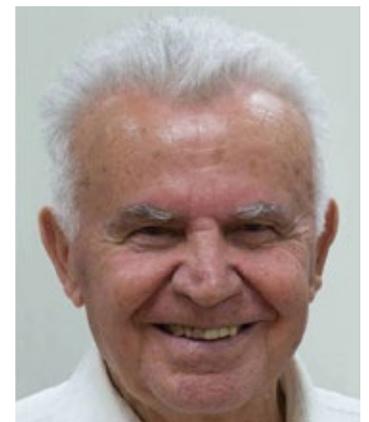
**T**heophanes (Theo) Solomos earned his BS in 1956 and MS in 1957 from the College of Agriculture in Athens, Greece, and a PhD in plant physiology in 1963 from the University of Cambridge, U.K. At Cambridge, Theo worked with John Barker in the School of Botany studying carbohydrate metabolism in plants. He

published four articles in *Nature* based on his doctoral studies at Cambridge.

Theo then undertook postdoctoral studies with Mary Spencer at the University of Alberta in Canada, where he began work on mitochondria. He moved south in 1970 to join the George Laties lab at the University of California, Los Angeles (UCLA), to study ethyl-

ene, fruit ripening, and mitochondrial cyanide-resistant respiration. After UCLA, Theo received an assistant professor position in 1975 in the Department of Horticulture at the University of Maryland, College Park, where he continued to study ethylene, fruit ripening, senescence, and cyanide-resistant respiration.

*continued on page 26*



## THEOPHANES SOLOMOS *continued from page 25*

Theo published several articles as a postdoctoral student, one in particular in *Nature* on fruit ripening. Very soon after he started at the University of Maryland, he published a well-received review article on cyanide-resistant respiration in higher plants in the *Annual Review of Plant Physiology*.

Theo was an active member of ASPB for longer than any of us 60+-year-olds can remember. He retired in 2006 but remained active in ASPB for many years after his retirement.

Theo was a true scholar and intellectual. He loved to work on difficult problems. All four of us worked in some way or another on the effect of hypoxia (low but not anaerobic concentrations of oxygen) on fruit ripening and some of us on cyanide-resistant respiration in plants. It was absolutely clear that low levels of oxygen reduced the rise in respiration during climacteric fruit ripening and that fruit could ripen in the presence of inhibitory concentrations of cyanide.

I (Mark Tucker) joined Theo's lab as a graduate student in 1975 soon after he started work at the University of Maryland. My project was to study the role of cyanide-resistant respiration in banana fruit ripening. Theo was fond of saying that cyanide-resistant respiration was a conundrum that needed to be solved, and conundrums were the best problems to work on. Theo had the

idea that the alternative oxidase (cyanide-resistant oxidase) might play a role in the hypoxic response in fruit because the alternative oxidase had a lower affinity for oxygen. We didn't actually solve the cyanide and fruit ripening conundrum, but it was a rewarding experience for me.

I (Angelos Kanellis) followed soon after Mark to complete my PhD with Theo. I worked with Theo to understand the effect of low oxygen on fruit ripening. This topic was one of Theo's favorites and for many years afterward was one of our preferred conversations. Theo taught me to critically assess scientific matters and to ask the right questions. He educated me on how to design experiments, to successfully execute them, and to analyze the data and write reports and manuscripts. He also taught me how to work well with people to achieve shared research objectives.

We (Dingbo Zhou and Panos Kalaitzis) followed in succession after Angelos to receive our PhDs working with Theo. I (Dingbo Zhou) did some computer programming and laboratory experiments to model how oxygen consumption by the fruit and gas diffusion into the fruit affected the concentration of oxygen inside a fruit cell. This model was used to identify the cellular concentration of oxygen that reduced the reduction in the rate of respiration observed in fruit stored in a low-oxygen atmosphere.

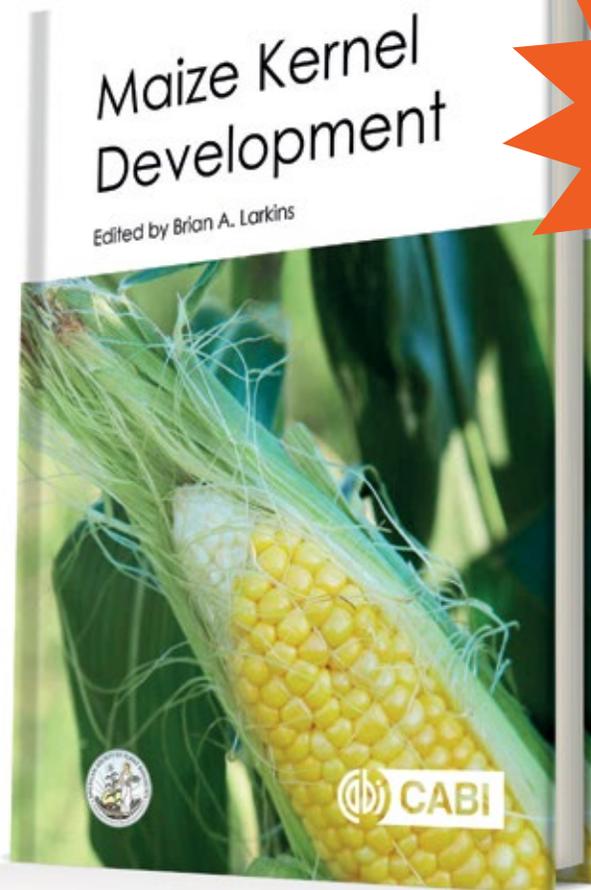
I (Panos Kalaitzis) picked up an interest in hypoxia while working with Theo, and I'm still working to define the mechanism of action of hypoxia on plant development. Theo's original thought that the alternative oxidase played a role in hypoxia changed over time, but he never lost interest in trying to identify the mechanism by which reduced oxygen suppressed metabolism in fruit and other plant organs. Theo instilled in us the importance of solving the hypoxia puzzle, and he had some very novel and interesting ideas on how to investigate it. He insisted that we not pay too much attention to results on hypoxia in mammalian systems. Plants evolved their own way of handling oxygen needs.

One of the most important lessons Theo taught us was that research is fun. His knowledge of science was encyclopedic. It was always enjoyable to discuss science with Theo. He became a good friend to all of us. We will miss his penchant for tackling difficult problems and his friendship. He was passionate about his research and would discuss his thoughts and ideas with vigor.

Over the many years of his research career, Theo mentored and befriended many graduate students and postdocs. Moreover, he was a good friend and colleague of many scientists in the ethylene and fruit ripening research community. He worked closely with Morris Lieberman, Jim Anderson, and Autar Mattoo

at USDA in nearby Beltsville, Maryland, in the early years when the pathway to ethylene synthesis was still in its infancy.

Theo contributed to a better understanding of climacteric fruit ripening and the role of reduced oxygen on the ripening process. Theo helped optimize the use of low oxygen and the ethylene action inhibitor 1-methylcyclopropene (1-MCP) for storage of climacteric fruit. Storage of apples in a low-oxygen atmosphere with 1-MCP has become a standard commercial practice for long-term storage of apples. ■



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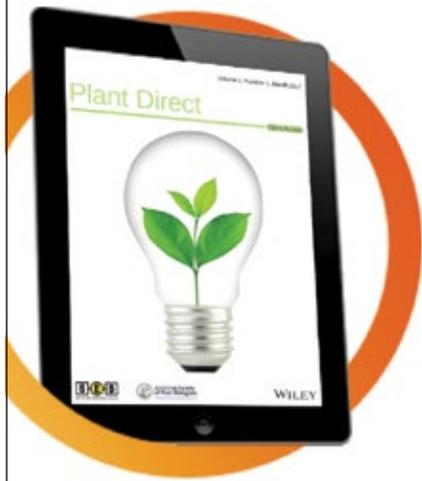
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