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# ASPBnews

THE NEWSLETTER OF THE AMERICAN SOCIETY OF PLANT BIOLOGISTS

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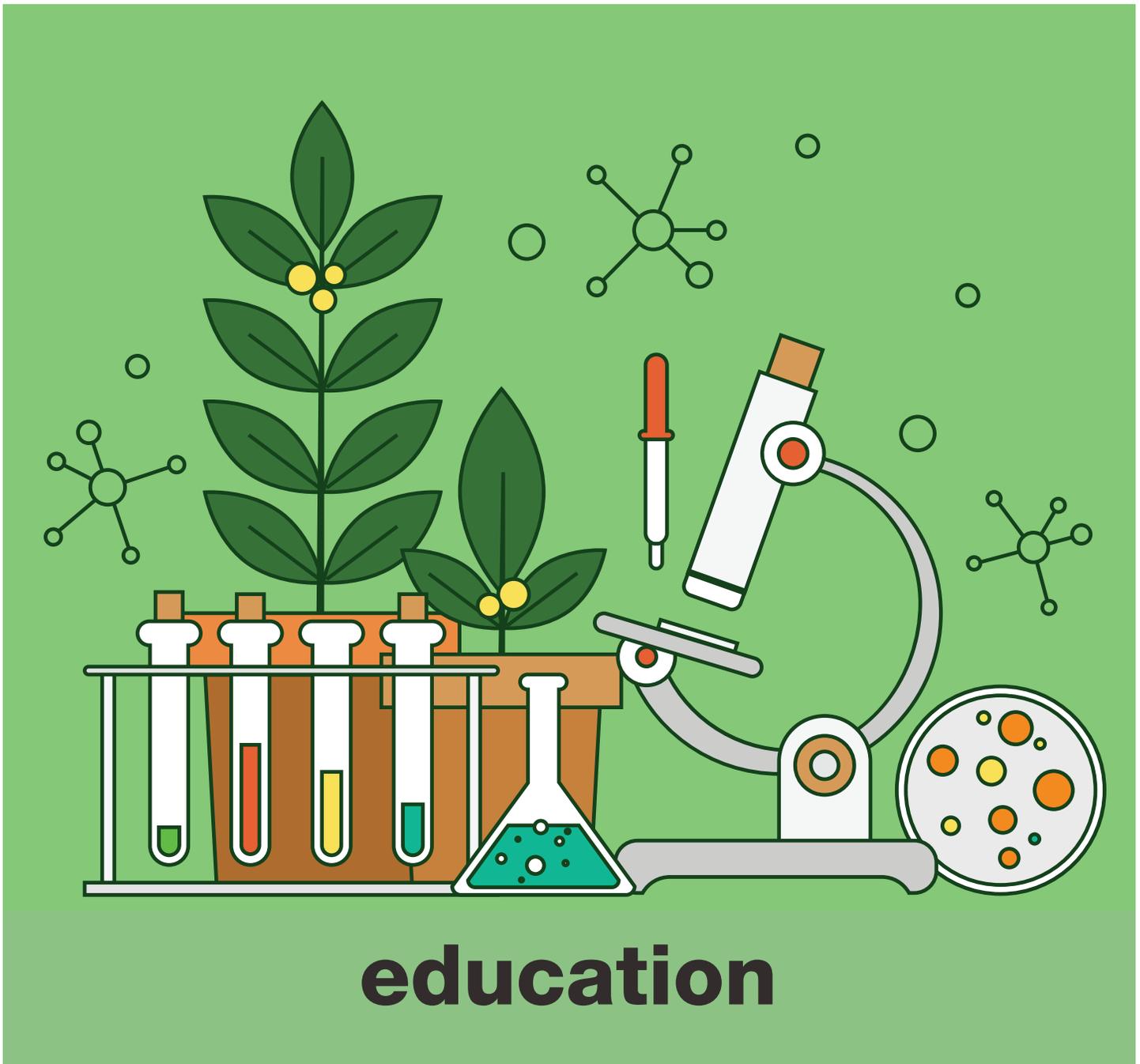
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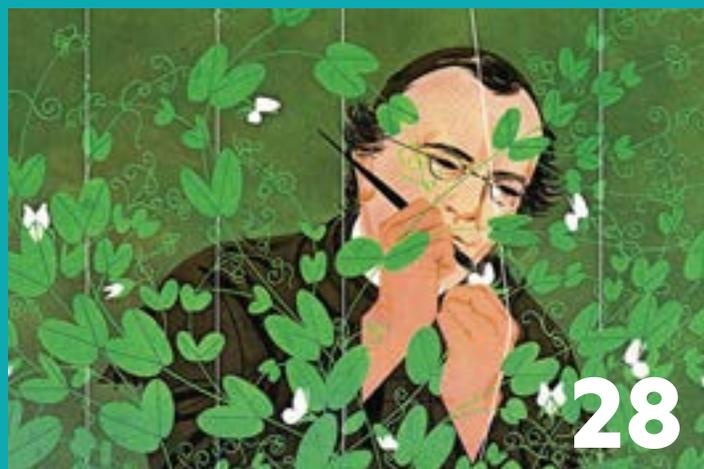
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## The Power of ASPB Is You

BY KATIE DEHESH

ASPB President, University of California, Riverside

The American Society of Plant Biologists that we know today began as an offshoot of the Botanical Society of America. The latter encompassed all traditional areas of plant science, including taxonomy, anatomy, genetics, ecology, physiology, and so forth. However, a desire to establish plant physiology as a separate branch of plant science led to a movement that (despite much resistance from the mother society) dissolved the existing section in favor of an independent plant physiology society, which was then founded in 1924. This new society was christened the American Society of Plant Physiologists (ASPP), and together with its own journal (*Plant Physiology*) and associated scientific meetings, ASPP provided the framework for plant physiology as a distinct discipline.

Over time, ASPP experienced many challenging changes that helped channel it into a well-established, influential body with academic and social impacts. One of the most notable of these changes in recent times was the launching of *The Plant Cell* in 1989 by Bob Goldberg, providing a platform to publish articles with the highest standards and the most exciting plant research findings rapidly and effectively. Indeed, *The Plant Cell* played a pivotal role in helping guide ASPP into the revolutionary era of molecular biology, placing plant research articles among the highest ranking science published in *Cell*, *Science*, and *Nature*. In the past 33 years, *The Plant Cell* has remained one of the most competitive and high ranking plant journals that exclusively publish novel advances. In conjunction with these developments, *Plant Physiology* also expanded its reach during Natasha Raikhel's tenure as editor-in-chief, publishing articles in bioinformatics, genomics, and systems biology and increasing its visibility and impact factor.



Another game changer, initiated by a collective effort of leading community members, was the renaming of ASPP as ASPB in 2001 to reflect the Society's expansion to a wider plant science community. As a result of this diversification, ASPB's objectives broadened to encompass publishing additional high-impact research, enhancing collaboration, furthering education via innovative mentoring programs, nurturing the development of thoughtful leaders, expanding public outreach programs, and promoting legislative involvement to support scientific advancement.

With time, changes in membership demographics led to an increased role of women in the Society, greater international membership and involvement, and the addition of subdiscipline groups within the Society. ASPB has expanded its activities focused on inclusion, such as encouraging the involvement of early career plant scientists and members from primarily undergraduate institutions and including and nurturing marginalized members of our community.

For example, the collective efforts of Mary Williams and Crispin Taylor led to NSF funding of the project named ROOT & SHOOT (Rooting Out Oppression Together and SHaring Our Outcomes Transparently). This project is providing a framework for building a culture of diversity, inclusivity, equality, and opportunity for a scientific career for all in our community.

A long list of ASPB members have actively dedicated time to building today's Society as we know it. Despite much commendable progress, like all societies ASPB still has much to achieve, many reforms to make, and gaps to fill. Further growth of ASPB as a successful enterprise depends on sustained efforts to develop a wide range of initiatives in parallel with the ever-changing technological advances and diverse demographic fabric of our broader society.

One area for further growth is expansion of educational programs. I believe that high on our list of goals should be education of the next generations of scientists about plant biology from very early on. I have firsthand experience with this need from teaching undergraduate classes of up to 600 students in which the majority are unaware of the contemporary concepts, strategies, and technologies embraced by plant scientists, including those used to address critical questions affecting our daily lives. Many students are under the impression that plant biology is restricted to botany and taxonomy. Educating these students from an early age is a daunting but critical task that requires concerted efforts to teach them about plants and their applications, starting in their homes and continuing in grade school and beyond.

Although there are many commendable programs nationwide that expose K-12 kids to plants and their importance to our

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## ASPB Council

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

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## PRESIDENT'S LETTER

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planet, I think there is still an opportunity for ASPB to foster a program focused on the K–3 group. We need to devise a new and attractive approach to capture young kids' interest and maintain their attention, and one possibility is to wrap scientific facts in stories. When I was a kid, my grandmother taught us about the regenerative ability of plants using the simple story of a confrontation between a goat and a grapevine. In this story, the goat trampled on the vine and berated it for being a weaker being. After enduring the goat's harsh treatment, the grapevine softly responded, "Yes, you may walk all over me, but I will grow again, no matter what. But when humans cut your head off, you cannot regrow it." I have savored this story throughout my life as a fun and educational lesson on resil-

ience, endurance, and the ability to survive, and as an illustration of plants' ability to regenerate.

If you know folktales or other stories featuring plants, please share them with us at [info@aspb.org](mailto:info@aspb.org). We will collect them to publish in an online educational booklet, initially in English and later perhaps in other languages.

Education of our youngest generation in plant biology requires the involvement and efforts of each one of us. You are the bedrock of ASPB; you are the power of ASPB. Please help ASPB project the excitement of this fast evolving and dynamic discipline to our young ones, and help pave the way for the future of plant science by attracting new generations of scientists to our field.

## 2022 ASPB Election Results

Many thanks to those members who took the time to vote earlier this summer, and hearty congratulations to our newly elected members of the Board of Directors! Their new service roles for ASPB will begin on October 1, 2022, and you can look for more information about them in the next issue of the *ASPB News*.



**Incoming President-elect**  
**Leeann Thornton**  
*The College of New Jersey*



**Incoming Secretary-elect**  
**Ian Wallace**  
*University of Nevada, Reno*

Congratulations, too, to our newly elected **Enid MacRobbie**  
**Corresponding Members:** Tzyy Jen Chiou, Andreas Schaller, and Nicolas Smirnof!

Welcome to the *ASPB News* “Perspectives” column. These articles explore the topical theme of each quarterly issue of the newsletter. They are typically written by members who are actively involved in the work of the Society to support and nurture plant science and plant scientists.



# Using Student Learning Outcomes to Guide Your Instructional Practice

BY KATIE BURNETTE, University of California, Riverside  
and MINDY FINDLATER, University of California, Merced

**C**ongratulations—you made it through 2021–2022! It’s been a rough few years, but hopefully your teaching is returning to a sort of normal, or maybe a new normal. One of the returning constants many of us face is regular changes to our teaching and teaching-related service loads. Maybe you will be teaching a new biology course this year, or are considering making some adjustments to an existing course. Perhaps your department is discussing possible revisions to a course series, or to an entire major. One phrase you may have heard is “student learning outcomes” (SLOs), and the need to consider them during these processes. We are here to give some

practical advice for starting or continuing the use of student learning outcomes in your instructional practice.

## What Are Student Learning Outcomes?

Depending on whom you ask, you may get a slightly different definition, but in the simplest terms SLOs are the measurable, specific skills and knowledge students ought to be able to demonstrate after completing a course activity, lesson, or module. SLOs help instructors and students understand the purpose and goals of a course. It can be difficult to know how to begin integrating

SLOs into current or future classes; we want to help you make steps toward starting or continuing your use of this instructional tool.

## The How and Where of SLOs

One of the most exciting and challenging aspects of teaching biology is that the field of knowledge is constantly expanding. Given that you simply can’t teach everything, even on one particular topic, how do you decide what to include? For example, you would never teach an introduction to plant biology without including some discussion of how plants obtain energy from sunlight. But how do you change the thought of “I really want my students to think about the importance of photosynthesis” into a discrete, achievable outcome? Writing SLOs is challenging, but the good news is that you do not have to start from scratch.

Many scientific groups and societies have formed working groups tasked with generating lists of core concepts and learning objectives for undergraduate courses in their field or discipline. One of the best sources of learning objectives for a wide variety of plant courses is the *ASPB–BSA Core Concepts and Learning Objectives in Plant Biology for Undergraduates* (<https://bit.ly/ASPB-BSA-CoreConcepts>). This document covers a multitude of plant-related content in four major domains of life science and has a depth and breadth that allow coverage of most undergraduate biology course topics. *ASPB’s Principles for Teaching Plant Biology* is another wonderful resource for finding SLOs for plant biology courses (see “*ASPB’s Principles for Teaching Plant Biology*” by Erin J. Friedman on page 16). Many other societies have generated similar lists; a nonexhaustive sampling of these resources is on page 6. Our expertise is mostly with college-level biology courses, but there are similar resources from other disciplines and for the K–12 level.

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## PERSPECTIVES

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### Using SLOs in Course Design and Implementation

Deciding on a set of SLOs to use in your course is just the beginning. You can then leverage your SLOs into improvements in your course planning and design, giving students a clearer picture of the course schedule and coverage. Once your SLOs are set, you have a framework of essential skills and content you can use to create units or modules within the course. Each course module should align with a minimum of one SLO, and each SLO should be covered in at least one module (and preferably more than one!).

For example, if you want students to learn how to interpret graphs, you need to build in multiple opportunities throughout the course for students to analyze and discuss graphs. If you want to include content (e.g., a specific example, video, or classic experiment) that isn't related to one of the SLOs, that's a sign that you need to either add another SLO or consider removing the content. It's well worth your time to check for alignment of your activities and content with the goals for your course.

SLOs are also the first step in backward course design: begin with each SLO as a starting point, plan assessment activities and questions around the SLOs, and design instruction and learning activities keeping the SLOs and related assessments in mind. Backward design can make classes more student centered, and it can also make it easier to incorporate active learning and relevant assessments into your courses. And as an added bonus, you can separate the SLOs by module and copy them into a study guide to distribute to students before exams, a tool that our students have greatly appreciated.

### Advanced SLO Users

Perhaps you first heard of the concept of learning outcomes long ago, and you have already incorporated many of the concepts into your instructional practice. What's next? One possible next step is to move beyond SLOs related to biology skills and content and begin to generate SLOs based around student self-efficacy, STEM identity, and attitudes toward biology. Studies in

this growing part of the education research field have found a strong relationship between students' mindset and their success in scientific courses and majors. SLOs and assessments for these concepts are a current topic of study (see "Advice for Using Published Assessments in Your Classroom" by Kathryn M. Parsley on page 7).

Another next step is to encourage your colleagues teaching alongside you to adopt SLOs in their instructional practice. In addition to encouraging the spread of research-based teaching techniques in your department, you will also be laying a strong foundation for major- or program-level course alignment. When courses have clear, relevant SLOs, they can be used to create a map of core concepts and techniques that students will be introduced to during their time in your department. Further, program-level SLOs can be used to create or source quality evaluations of student knowledge, allowing program-level assessments to

become a true reflection of what is taught in your department's courses.

### To Wrap Up

We hope you can use these ideas and resources to start, or continue, down your path to using relevant, achievable, measurable student learning outcomes in your courses. No matter where you are in your teaching journey, know that change takes time. Identifying a set of essential SLOs for one class is a great first step. Remember, creating strong student learning outcomes is a process, and regularly refining these outcomes to best benefit your students is the goal!

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Friedman, E. (2021). Introducing: The newly revised Principles for Teaching Plant Biology. *ASPB Plant Science Today*. <https://blog.aspb.org/plantbiologyprinciples/>.

## Resources for Developing Student Learning Outcomes

### AAAS—Vision and Change in Undergraduate Biology Education

<https://bit.ly/VisionChange>

### American Society for Biochemistry and Molecular Biology—Foundational Concepts

<https://bit.ly/ASBMBcoreconcepts>

### American Society for Microbiology—Curriculum Guidelines for Undergraduate Microbiology

<https://bit.ly/ASMcurriculum>

### Ecological Society of America—Ecology Learning Framework

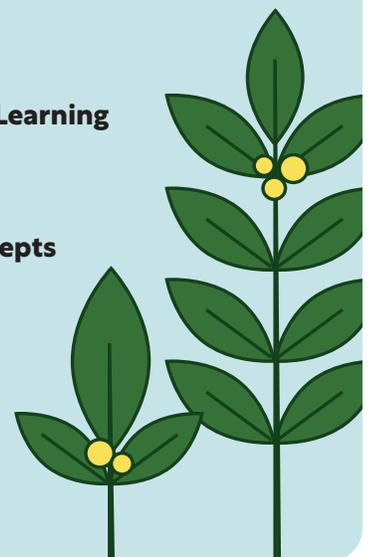
<https://bit.ly/ESAcoursesource>

### Genetics Society of America—Core Concepts and Competencies in Genetics

<https://bit.ly/GSAcourseconcepts>

### Partnership for Undergraduate Life Science Education—Resources for Applying Vision and Change

<https://bit.ly/LifeScienceEd>



# Advice for Using Published Assessments in Your Classroom

BY KATHRYN M. PARSLEY  
kathrynparsley@gmail.com

**W**hen was the last time you had to create an assessment for one of your classes and thought, “Wow, I wish I didn’t have to do this”? Creating assessments can be arduous, causing instructors to shy away from the process or rely solely on textbook materials for evaluating student knowledge. Although assessment can mean different things to different people and is used



Kathryn M. Parsley

in multiple contexts, the term is generally used in education to refer to an exam or survey intended to measure students’ knowledge, attitudes, beliefs, or learning processes. In this article, I offer tips and advice for using assessments and related resources that are aligned with your student learning outcomes.

An entire field is dedicated to creating questionnaires and other instruments that measure intelligence, behavior, and other mental attributes. The field is called *psychometrics*, and applying these techniques in your classroom can enhance your ability to accurately measure student learning outcomes, science identity, self-efficacy, and much more (American Psychological Association, 2022). What many educators don’t realize is that their students can benefit directly from the application of psychometrics—and it doesn’t have to be a difficult experience!

## Types of Assessment

In general, I lump assessments into two categories: knowledge based and psychological. Knowledge-based assessments are what most people think of when they think of assessment: a measure of changes

in student knowledge or learning outcomes. Some knowledge-based assessments are standardized, such as the ACT, the SAT, and the GRE, and others are concept inventories validated in specific audiences of students—for example, the Genetics Concept Assessment (Smith et al., 2008). Knowledge-based assessments may include

multiple choice questions, open-ended questions, and even qualitative interview questions.

Psychological assessments measure concepts such as identity, self-efficacy, belonging, and beliefs. Although all assessments are psychological in part, I refer to these assessments as psychological because they measure aspects of student psychology apart from things like intelligence or knowledge. Instructors may overlook psychological assessments, but I would caution against doing so. Measuring students’ science identity, for example, can provide a great deal of context to their score on a knowledge-based assessment (Lockhart et al., 2022). Additionally, using a measure of STEM career interest can add valuable insights into students’ performance in your class and their likelihood of persisting further in STEM courses (Kier et al., 2014).

## Assessment Resources and How to Find Them

Many professional societies related to the courses and topics you are teaching offer assessment resources of some sort. Although ASPB does not currently have a plant biology

assessment, the Principles for Teaching Plant Biology (Friedman, 2021; also see page 17 in this issue) are aligned with the Next Generation Science Standards (<https://www.nextgenscience.org/>) and can inform assessment strategies. In addition, the *ASPB–BSA Core Concepts and Learning Objectives in Plant Biology for Undergraduates* (ASPB and Botanical Society of America, 2011) are aligned with the Vision and Change in Undergraduate Biology Education initiative (AAAS, 2011). These are excellent starting points when you look for topics and concepts to assess in your classroom, and these resources can help you determine whether your curriculum is up-to-date relative to the educational goals for your field.

Another way to find assessments that are aligned with your classroom goals is through a literature search. I suggest combining terms such as *assessment development*, *assessment validation*, *concept inventory*, *questionnaire*, *measurement*, and *instrument* with whatever concept you want to measure. For example, if you want to look at assessments for student acceptance of the concept of evolution, you could try search terms such as *evolution acceptance questionnaire*, *evolution acceptance assessment*, *evolution acceptance measurement*, and *evolution acceptance instrument*. This strategy will likely get you many results to sift through, at which point you can narrow the results based on your desired educational level (e.g., K–12, undergraduate) and other demographic characteristics.

## How to Tell Whether an Assessment Is High Quality

Once you have found some assessments to evaluate for use in your classroom, it is important to understand what characteristics

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## PERSPECTIVES

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to look for in the publications describing each assessment. Useful publications include a list of the questions or statements in the assessment, a detailed description of how the assessment was developed, and multiple sources of validity evidence. To better understand validity evidence and how it should be presented in assessment publications, I highly recommend referencing the *Standards for Educational and Psychological Testing*, developed by the American Educational Research Association, the American Psychological Association, and the National Council on Measurement in Education (2014).

Even if an assessment is validated and well made, however, the questions may not make sense to your students or to you, so always review assessments for clarity, and make sure the questions are appropriate for your purposes. You have the final word on whether an assessment is the right choice for your class, so avoid using an assessment only because others say it's great. If it doesn't seem like a good fit for your class, and especially if it doesn't measure the student learning outcomes you want it to, then I highly recommend you not use it and try for another one instead.

### Consider Doing Assessment Development Research

If you are unable to find an assessment on your topic that suits your needs but know that others would benefit from such an assessment, it may be worthwhile to develop and validate a new assessment. Although assessment development research requires specialized knowledge and can be a lengthy process, it is an excellent experience for instructors who use validated assessments in their classroom. Developing and validating an assessment can offer a great deal of insight into how validated instruments work, what

the best practices are for using them in the classroom, and why they are useful in various educational contexts.

The following are some tips for conducting this type of research:

- Do try to find an assessment that measures what you want before developing one yourself.
- Do work with an assessment development expert.
- Do collect multiple types of validity evidence.
- Do refer to the *Standards for Educational and Psychological Testing* for advice on designing and validating assessments.
- Do consult other assessment development publications to explore possible methodologies; the *Journal of Psychoeducational Assessment* is a great resource.
- Do base your instrument on a sound theoretical framework.
- Don't make claims about validity without collecting validity evidence.
- Don't assume that your questions measure what you think they measure—this is exactly why collecting validity evidence is important!
- Don't try to embark on an assessment development study alone for your first time.
- Don't combine several concepts into one assessment.
- Don't mix psychological (attitudes, beliefs, opinions) items with knowledge-based (intelligence, content knowledge, understanding) items in the same assessment.

### Conclusion

Although by no means a comprehensive guide to using assessments in your classroom, this article offers a point of

departure for undertaking these efforts. The resources presented here are just a taste of what the valuable and interesting field of education psychometrics has to offer. I highly recommend taking the time to familiarize yourself with assessments that might be useful in your classroom.

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## MEMBERSHIP CORNER

ASPB members share a common goal of promoting the growth, development, and outreach of plant biology as a pure and applied science. This column features some of the dedicated and innovative members of ASPB who believe that membership in our Society is crucial to the future of plant biology. If you are interested in contributing to this feature, please contact ASPB Membership at [info@aspb.org](mailto:info@aspb.org).



### Summer Blanco

**Title:** PhD Student

**Place of Work or School:** University of Georgia

**Member Since:** 2020

**Research Area:** Evolutionary biology & plant reproduction

#### What would you tell colleagues to encourage them to join ASPB?

ASPB is a great resource to keep up with current research and build a network of peers and mentors!

#### Was someone instrumental in getting you to join ASPB?

The #AcademicTwitter community brought me to ASPB. I saw all the great workshops ASPB was planning and decided to join.

“Find a community that celebrates you for you and makes you feel empowered.”

#### Have you enhanced your career, lab, research, or education using ASPB, the Plant Biology meeting, section meetings, *Plantae.org*, *The Plant Cell*, *Plant Physiology*, or *Plant Direct*?

Attending conferences as an undergraduate and now as a graduate student has exposed me to a wide variety of research that has helped me discover and hone my passion for my current research. I have also met really supportive and inspiring scientists who I am privileged to call peers and mentors through ASPB.

#### How and why did you get into plant science?

When I was a high schooler, I attended a career day talk given by a local community college lecturer who worked as a horticulturist at Disneyland in Anaheim, California. Inspired by this talk, I decided to volunteer for a summer at the California Botanic Garden, and that experience cemented my decision to attend college as a botany major. I've never looked back!

#### What is your favorite thing about being a plant biologist?

My favorite part is that my friends and family send me texts regularly about their dead/dying/not fruiting plants, asking for advice. It makes me happy that they think of me as their go-to plant expert. Even though I don't do plant pathology, I'm happy to extend my expert Google skills to help them the best that I can!

#### How important is social media to your education or career as a plant scientist?

I call Academic Twitter “the new LinkedIn for scientists” because that is how important it has been as a networking platform for me. Not only is it rich with crowd-sourced resources, but I have met and cultivated such a supportive network of graduate students, postdocs, and professors. I actually applied to a graduate program because I had found a professor on Twitter whose work I was really interested in.

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

It is so important for your career development to have *multiple* mentors. Don't be afraid to reach out to someone who inspires you!

Also, sometimes academic environments make you feel as if you can't be yourself, as if you must pretend to be someone you are not. Find a community that celebrates you for *you* and makes you feel empowered. They are out there! Don't be afraid to be who you are, and don't let the haters slow your momentum.

#### What do you still have to learn?

Being a first-year graduate student, I find myself surprised at how challenging it can be to learn and apply new and challenging concepts. I'm still learning how to think like a scientist, and it's really fun to watch my thinking change in real time the further I progress. It's really rewarding to see my progress, and I have a lot more to learn!

#### What are your hobbies?

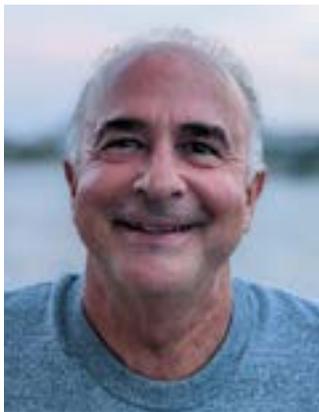
I love to roller skate. During the summer, I love to grind rails and drop in bowls at my local skate park, and during the winter I switch to my indoor dance skates. I was told in grad school to have a “nonnegotiable,” and roller skating is mine!

# Why I Support the Centennial Challenge Campaign

BY ROB LAST

ASPB Past President, Michigan State University

**A**SPB exists to promote the growth and development of plant biology, to encourage and publish research in plant biology, and to promote the interests, growth, and education of plant scientists in general. It has 3,000 members worldwide and serves many more through the core journals *Plant Physiology* and *The Plant Cell*, annual conferences, and professional development activities for early career plant biologists.



Rob Last

The Centennial Challenge evolved in the recognition that ASPB will be 100 years old in 2024, and with the hope of ensuring that the organization is vigorous for 100 more years. At Plant Biology 2024 in Honolulu, we plan to honor the longevity of the organization and its accomplishments. We will also celebrate members who have contributed to the Society's success and financial security by enhancing its ability to do good works that contribute to the careers of community members and to react to new opportunities and needs. We seek to raise \$3 million by the time of the centennial meeting, and we would be delighted if you will help us meet or even exceed this goal. I'd like to share a few reasons I support the Centennial Challenge.

### COVID-19 Initiatives

COVID-19 changed everything, and ASPB was a stabilizing influence for members around the world. ASPB staff and leadership responded to the disruptions in work and travel in a variety of ways. Perhaps the most notable was to rapidly shift plans for Plant Biology 2020 and 2021 from 100% live to 100% online. Although the 1,000 or so

community members who typically attend the annual Plant Biology conference missed one another's company those two years, about 4,300 community members from around the world were able to participate virtually.

In another response, staff and community members created something brand new using existing web resources

and expertise. Inspired by two early career researchers, the *Plantae Presents* international seminar series began April 1, 2020. Each seminar session features one or more talks between a senior researcher and an early career researcher, and there are now almost 40 webinars and more than 70 paired talks, with speakers and participants from all continents except Antarctica. The talks are available on YouTube; most have been viewed more than 300 times, and some more than 2,500 times ([https://bit.ly/Plantae\\_Presents](https://bit.ly/Plantae_Presents)). The presentations can be repurposed for teaching and modified journal clubs and can supplement group meetings and other training venues.

These are a few examples of how staff, community, and leadership came together very rapidly to serve the plant science community. Even with contributions by community members, these activities were not free, and a larger ASPB endowment could support future agile and impactful initiatives that currently are not available or even imagined.

### Opportunities for Early Career Members

ASPB provides many opportunities to community members, especially early career members. These efforts typically have asso-

ciated costs, and additional financial support can support increased participation.

Travel awards to the annual conference increase attendance by young community members. They also broaden the participation of women and members of groups underrepresented in plant biology.

A recent innovation is the inclusion of early career representatives on most standing and ad hoc committees; a University of California, Berkeley, postdoctoral scientist, Allie

### Most Recent ASPB Pioneer Members (as of August 4, 2022)

Frederick Ausubel  
 Harry Beevers  
 Philip Benfey  
 John Boyer  
 Robert Burris  
 Alice Cheung  
 Marc Alan Cohn  
 Jeff Dangl and Sarah Grant  
 Arthur Galston  
 Howard Goodman  
 Karl Hasenstein  
 Kenneth Keegstra  
 Sally Mackenzie  
 Donald Ort  
 Eberhard Schäfer  
 Tom Sharkey  
 Ming-Che Shih  
 Zinmay Renee Sung  
 Heven Sze  
 Elizabeth Vierling  
 Alessandro Vitale  
 Shang Fa Yang Yang  
 Ray Wu

<https://aspb.org/membership/aspb-pioneer-members/>

Gaudinier, serves on the Centennial Challenge Committee. The committees benefit greatly from fresh ideas, and the early career representatives gain leadership experience, which enhances their contributions in their local environments.

The Ambassador Program is a self-governed group oriented toward expanding membership and participation by early career plant scientists in industry, academia, and government. It is tightly associated with the Membership Committee, both providing short-term benefits to ASPB and bringing the next generations of leaders into the fold.

The Plantae Fellows Program provides opportunities for early career community members to contribute to Plantae-focused activities and gain experience and visibility. In turn, Plantae Fellows receive mentorship from more senior community members.

### What If Dedicated Funding Doesn't Happen?

So many of us were inspired to become scientists through authentic research experiences supported by the Summer Undergraduate Research Fellowship (SURF) program. These fellowships are specifically targeted to undergraduates who wish to perform research associated with plant biology during the summer. NSF supports several plant-oriented Research Experiences for Undergraduates sites, including one that I started at Michigan State University, but the opportunities are limited given the number of excellent applicants each year. A special feature of the SURF program is that it targets young researchers already working in ASPB-affiliated laboratories. Another is that SURFers attend the annual ASPB meeting to present their work, becoming part of our community.

SURF is a relatively expensive program, compared with travel awards and other forms of recognition. Such programs have a major influence and inspire future leaders across our community. Their expense puts them at risk when ASPB leadership and staff must consider cutting costs: in fact, this program was cut in half when ASPB was forced to reduce overall spending in 2019. As a result of these cuts, more than 30 young people lost an opportunity to conduct ASPB-sponsored summer research. This program is of enormous benefit to the vitality of our community, and it should be perpetually funded by an endowment.

### Why Raise Funds to Celebrate the ASPB Centennial?

My short answer is: to ensure that we can continue to serve the plant biology community for decades and generations to come. We rely on journal revenues—in addition to membership dues and endowments—to employ staff, maintain the Gude headquarters in Rockville, Maryland, and fund most of our good works and our annual meeting. The journals have provided much of our revenue over the years, but the business model for scholarly publishing continues to evolve toward open access and away from annual library fees. We do not know exactly how this will impact ASPB revenue in the long term, but it is likely to have a negative effect.

Societal changes are leading to reductions in paid memberships: the Internet and social media influence everything, including the perceived value of belonging. Although our discipline, conferences, and journals have flourished, over the past decade ASPB has seen an attrition in membership similar to that of other scholarly organizations. ASPB leadership has identified increasing donations, along with stabilizing publishing revenues, as key to ensuring that our scientific field grows and diversifies. The generosity of the Legacy Society members, and increasingly of supporters of ASPB Pioneer recognition efforts, speaks to the dedication of members to the future of our community.

I encourage you to consider the role that ASPB has played in your own career and those of your friends, colleagues, and trainees, and to contribute to the Centennial Challenge campaign to the extent that you are able.

**100** Centennial Challenge  
1924 2024

“The Centennial Challenge strives to raise \$3 million by ASPB’s 100th anniversary in 2024. Join the challenge at <https://aspb.org/donation-funds/>

2024

2021

\$3,000,000  
\$2,700,000  
\$2,400,000  
\$2,100,000  
\$1,800,000  
\$1,500,000  
\$1,200,000  
\$900,000  
\$600,000  
\$300,000  
\$0

SCAN ME

AS OF JULY 31, 2022. UNAUDITED.

## Policy Update

BY JOANNA RATIGAN  
Lewis-Burke Associates, LLC

### Congressional Updates

#### House Appropriations Committee Approves FY2023 Spending Bills

The House Appropriations Committee has released and approved all 12 of its spending bills for fiscal year (FY) 2023, proposing significant increases to climate and environment programs across several federal agencies. Even though the committee's recommended funding levels did not match the even greater increases put forward in the FY2023 president's budget request, the administration's priorities in climate change and clean energy remained evident in the House bills. The House and Senate must now negotiate between their respective proposed funding levels, which will likely take place after the midterm elections in November. A continuing resolution will therefore be needed to maintain government funding at FY 2022 levels before the two chambers can reach an agreement on topline spending and the split between defense and nondefense programs. The following are highlights for relevant agencies:

- The bill proposes a total of \$9.6 billion for NSF, a \$793 million or 9% increase above the FY2022 enacted level, including just over \$1 billion for climate science and sustainability research through the U.S. Global Change Research Program and clean energy technology. The committee's report also encourages NSF to support research on harmful algal blooms and development of technologies for carbon dioxide removal.
- The DOE Office of Science would be funded at \$8 billion, including \$905 million for the Office of Biological and Environmental Research (BER), an increase of \$90 million or 11% over FY2022. The bill would fully fund the Bioenergy Research Centers at \$105 million and would support BER's new Artificial In-

telligence for Earth System Predictability (AI4ESP) program to develop integrated observations and models focused on the water cycle and water resilience. The committee also recommended \$65 million for continued operation of the Environmental Molecular Sciences Laboratory to study microbial molecular phenotyping capabilities.

- The House bill would provide \$27.2 billion in discretionary funding to USDA, most of which would cover nutrition programs. The National Institute of Food and Agriculture (NIFA) would receive \$1.8 billion, a \$131 million or 8% increase over the FY2022 enacted level. The Agriculture and Food Research Initiative, USDA's signature extramural research program, would receive a relatively large \$55 million increase over FY2022 enacted levels. The bill also proposed modest increases for some climate-related programs, including \$5 million more for the Sustainable Agriculture Research and Education Program.
- The bill would provide \$878.8 million to NIH's National Institute of Environmental Health Sciences, a \$36.6 million or 4.3% increase above FY2022 enacted levels. Like the FY2022 omnibus, the bill does not include funding directly for the NIH Climate Change and Health Initiative after the administration recommended it receive \$100 million in the FY2023 budget request.

#### Sources and Additional Information

- The FY2023 House Commerce, Justice, Science Appropriations Committee report containing recommendations for NSF funding is available at <https://tinyurl.com/2myr56ba>.
- The FY2023 House Energy and Water Appropriations Committee report containing recommendations for DOE funding is available at <https://tinyurl.com/2p9bddj4>.
- The FY2023 House Agriculture Appropriations Committee report containing

recommendations for USDA funding is available at <https://tinyurl.com/4b5yfyju>.

- The FY2023 House Labor, Health and Human Services, and Education Appropriations Committee report containing recommendations for NIH funding is available at <https://tinyurl.com/z5jdehc3>.

#### Appropriations Committees Hold Budget Hearings with Agency Leadership

The House and Senate Appropriations Committees held several hearings with leaders from environmental agencies to defend the FY2023 president's budget request as they draft the next round of spending bills. The following are some observations on the relevant hearings:

- At the House Commerce, Justice, Science Subcommittee hearing with NSF Director Sethuraman Panchanathan, members asked how the agency's new Directorate for Technology, Innovation and Partnerships (TIP) will improve competitiveness and prepare the future U.S. workforce. Panchanathan noted that the directorate will activate research on societal grand challenges and that research directions will include mitigation, adaptation, and resilience, as well as improvements in data management and infrastructure to increase usability. The director also highlighted in his remarks that a \$300 million increase for climate change research will support activities within TIP.
- USDA Secretary Tom Vilsack testified before the House Agriculture Appropriations Subcommittee on April 28. In his opening statement, Vilsack discussed the role of agriculture in national security with regard to supply chains and economic stability. He also stressed the importance of research, noting that growth in biomedical research is accelerating at a higher rate than research on food, nutrition, and sustainability, which also play an integral role in human health. Throughout the hearing, Vilsack stated this point several times to emphasize the role of research investments

in mitigating and avoiding human and agricultural disease, maintaining U.S. global competitiveness, and reducing the impacts of climate change.

- Testifying before the House Energy and Water Development Subcommittee and Energy and Commerce Committee, Secretary of Energy Jennifer Granholm detailed DOE's FY2023 budget request, which features climate change prominently. Members of Congress and the secretary touched on the increased staffing of the Civilian Climate Corps and on efforts to secure clean energy supply chains.

#### Source and Additional Information

- A recording of the House Appropriations Committee hearing on the FY2023 NSF budget can be found at <https://tinyurl.com/y546fh9z>.
- A recording of the House Appropriations Committee hearing on the FY2023 USDA budget can be found at <https://tinyurl.com/metm34v3>.
- A recording of the House Energy and Commerce Committee hearing on the FY2023 DOE budget can be found at <https://tinyurl.com/5n7yyr58>.

### House Agriculture Committee Holds Hearing on the Role of Climate Research in Supporting Agricultural Resiliency

On June 15, the House Agriculture Committee held a hearing on climate research to inform the upcoming reauthorization of the Farm Bill, which expires on September 30, 2023. Topics discussed include the need for scientific research, education, and extension to mitigate and adapt to climate change; the lack of data infrastructure and culture of "small science" in the agricultural sciences, and how both impede progress; the perspectives of minority and limited-resource farmers; and the overarching importance of soil preservation and improvement.

These topics represent the Democratic majority's priorities with respect to research, and it signals their interest in investing in climate change, data infrastructure, the Agriculture Advanced Research and Development Authority, soil health, and minority-serving institutions. However, because the

November elections fall before the current Farm Bill expires, these priorities may not be as well represented in the Farm Bill if Republicans gain the majority.

#### Source and Additional Information

- A recording of the hearing is available at <https://tinyurl.com/5n89vbpe>.

### Senate Commerce, Science, and Transportation Committee Holds OSTP Director Nomination Hearing

The Senate Commerce, Science, and Transportation Committee held a hearing on President Biden's nomination of Arati Prabhakar to be director of the White House Office of Science and Technology Policy (OSTP). Prabhakar formerly served as director of the Defense Advanced Research Projects Agency and the National Institute of Standards and Technology. Committee members from both parties praised Prabhakar's career and were optimistic about her leading OSTP.

Senators' prepared remarks and questions mainly focused on the government's implementation of the CHIPS and Science Act of 2022, which would require the OSTP director to create a working group focused on vital emerging technology areas such as AI and quantum computing, and agencies to submit science and technology strategies to the office for review. Prabhakar expressed support for the legislation and argued that it would help her better coordinate research and development efforts across federal agencies. If confirmed, Dr. Prabhakar would be the first woman, immigrant, and person of color to lead OSTP. The committee subsequently voted to advance Prabhakar's nomination, and she is expected to be confirmed by the full Senate in September or after the midterm elections.

#### Sources and Additional Information

- A recording of the hearing is available at <https://tinyurl.com/bdfyu4hn>.

### Agency and Administration Updates

#### Environmental Agencies Release Equity Action Plans

The Biden administration released Equity Action Plans to address systemic barriers in policies and programs across federal agencies.

This announcement stemmed from Executive Order 13985, Advancing Racial Equity and Support for Underserved Communities Through the Federal Government, which President Biden signed on his first day in office.

Of interest to the academic and research communities, NSF's Equity Action Plan prioritizes increased participation of disadvantaged entities and describes the agency's intent to collect additional demographic data from the broader research community to better assess equity. The DOE plan establishes new programs to better serve underrepresented communities and outlines a commitment of nearly \$102 million to increase STEM talent among minority-serving institutions. DOE also released its framework for the Biden administration's Justice40 Initiative, which commits 40% of the overall benefits of federal investments in climate and clean energy initiatives to underserved and disadvantaged communities. The DOE plan describes five priority actions, which include increasing funding opportunities for new applicants, increasing participation in research and financial assistance programs, and expanding strategic stakeholder engagement in DOE programs.

#### Source and Additional Information

- The Lewis-Burke analysis of agencies' Equity Action Plans is available at <https://tinyurl.com/5yzjtpna>.

### Directorate of Biological Sciences Holds Advisory Committee Meeting

NSF's Directorate of Biological Sciences (BIO) held its Advisory Committee meeting in mid-May to discuss priority areas and upcoming initiatives, many of which pertain to climate and environmental sciences. Throughout the meeting, leadership emphasized the directorate's continued focus on the bioeconomy and life on a warming planet. Like many other NSF directorates, BIO is looking to expand use-inspired work to align with the new Directorate of Technology, Innovation and Partnerships, including designing new feedstocks for biomanufacturing of recyclables, mapping ecosystem changes, and discerning plant responses to extreme environments. Also of note, BIO head Joanne Tornow announced that she will retire at the end of September 2022.

*continued on page 14*

**POLICY UPDATE**  
*continued from page 13*

*Sources and Additional Information*

- More information on the May Advisory Committee meeting is available at <https://tinyurl.com/muybaed2>.

**Chavonda Jacobs-Young Confirmed to Lead USDA Research, Education, and Economics**

Chavonda Jacobs-Young was officially confirmed by the Senate as undersecretary of Research, Education, and Economics at USDA by a vote of 95–4. She will oversee key USDA research operations, including NIFA, ARS, the Office of the Chief Scientist, and the National Agricultural Statistics Service, among other agencies. Jacobs-Young previously served as administrator of ARS, acting director of NIFA, and director of the Office of the Chief Scientist, and she has also held positions at the White House Office of Science and Technology Policy.

*Source and Additional Information*

- A statement from the Senate Agriculture Committee leadership on Jacobs-Young's confirmation is available at [tinyurl.com/4jkw8wh](https://tinyurl.com/4jkw8wh).

**DOE Highlights Future Research and Funding Opportunities for Biological and Environmental Research**

The FY2023 president's budget request proposed \$904 million for the DOE Biological and Environmental Research program, an \$89 million or 11% increase above FY2022 enacted levels. The majority of new funding would support biological sciences, including \$100 million to continue support for the four Bioenergy Research Centers, with a greater emphasis on collaborative research to address clean energy challenges and translation of basic research.

Planned funding opportunities from BER in FY2023 include new, multidisciplinary Energy Earthshot Research Centers; \$10 million for Environmental Systems Science Research; and funding to continue planning to establish a new National Laboratory or Centers focused exclusively on climate resilience issues and to continue setting up the National Virtual Climate Laboratory.

Additionally, the Earth and Environmental Systems Sciences program is preparing to update and issue a new five-year strategic plan that will cover 2024 through 2029. Recent and planned workshops will inform the priorities of the new strategic plan.

*Sources and Additional Information*

- More information on the most recent BER Advisory Committee meeting is available at <https://tinyurl.com/5n-8su3hw>.
- The Integrated Mountainous Hydro-Climatic Workshop report presented at the last BER Advisory Committee meeting is available at <https://tinyurl.com/5dzn642x>.
- The FY2023 DOE budget justification is available at [tinyurl.com/3h9j82sn](https://tinyurl.com/3h9j82sn).

**Funding and Engagement Opportunities**

**NSF Seeking Recommendations for Environment-Focused Advisory Committee Members**

NSF is seeking recommendations for membership on 15 advisory committees, including those of the Directorate for Biological Sciences, the Directorate for Geosciences, the Office of International Science and Engineering, the Office of Polar Programs, the Directorate for Environmental Research and Education, and the Division of Astronomical Sciences. Committee members must demonstrate comprehensive knowledge, expertise, and ability in the respective subject areas. During the selection process, NSF may also consider balance in representation of institutions, regions, and groups typically underrepresented in STEM. All recommendations must be sent to the appropriate contact within 12 months beginning April 28, 2022; self-recommendations will be accepted.

*Source and Additional Information*

- The *Federal Register* notice containing instructions to submit recommendations for each advisory committee is available at <https://tinyurl.com/y75533t8>.

**Plant  
Biology**  
FUTURE  
MEETINGS



**2023**  
SAVANNAH, GEORGIA  
August 6-10



**2024**  
HONOLULU, HAWAII  
June 21-25

# ASPB Travels to the Lone Star State for the National Conference on Science Education

BY VALERIE HAYWOOD

ASPB Education Committee, Case Western Reserve University

After a two-year hiatus, the ASPB Education Committee was back on the road for the National Conference on Science Education, hosted by the National Science Teaching Association. Held March 31 to April 2, 2022, this event brought together educators and administrators from all science disciplines for the first face-to-face national science education conference since 2019.

The Education Committee was happy to be back in action, hosting an exhibit booth

led by Education Committee member Valerie Haywood, Senior Membership Manager Shoshana Kronfeld, and Education Coordinator Winnie Nham. ASPB members from the Houston area graciously volunteered their time at this event, which served more than 1,000 attendees. We offer heartfelt thanks to our ASPB member volunteers Sanghamitra Saha (University of Houston–Downtown), Adrian Ramirez (University of Houston–Downtown), and Rashmi Jayaram

(Lamar High School, Houston Independent School District).

If you have plant biology educational materials you would like to showcase in future education and outreach events, please contact Valerie Haywood at vxh20@case.edu. For more information on the ASPB Education Committee, visit <https://aspb.org/education-outreach/>.



Left to right: ASPB member volunteers Rashmi Jayaram and Sanghamitra Saha and Education Committee member Valerie Haywood in the ASPB Education and Outreach booth.



The ASPB Education & Outreach booth showcasing the wide variety of plant biology educational materials we offer.



ASPB member volunteer Adrian Ramirez (right), learning about sea life and making friends.



# ASPB's Principles for Teaching Plant Biology

BY ERIN J. FRIEDMAN

University of Lynchburg, Chair, ASPB Education Committee

What is aligned with the Next Generation Science Standards (NGSS), linked with the Advanced Placement (AP) Biology framework, and designed to help educators teach plant biology content to their students? The Principles for Teaching Plant Biology! These principles are a framework for understanding and appreciating the critical roles of plants in creating, improving, and sustaining life; they are a gateway to exploring the fascinating intricacies of plant science through inquiry and scientific thinking.

The list of principles is not a new concept; the 12 Principles of Plant Biology created 25 years ago remain a widely used resource for teaching and learning plant biology, especially within the K–12 educational community. However, a 2017 external assessment of the ASPB Education Committee's activities and products highlighted the 12 Principles as a primary area of focus for growth and improvement. The 12 Principles were aligned with the NGSS (<https://www.nextgenscience.org/>), but the NGSS was substantially revised in 2013, leaving the 12 Principles out of date. Additionally, the external reviewers identified a need to expand the educational offerings associated with the 12 Principles and to examine and broaden the methods for disseminating the content.

In May 2021, ASPB formed an advisory committee consisting of four Education Committee members and four external advisers

“I hope that these updated Principles will provide a useful framework for teachers. I value the opportunity to contribute to an effort to increase and enhance education about plants!

—Amy Dykstra

“I decided to participate in the Principles project in an effort to make plant biology more accessible to beginning students in biology and to interested people who are not professional scientists.

Working with the education team at ASPB was a pleasure.

—Robert Kennedy

who were selected by application; the external advisers included one educator from a primarily undergraduate institution, one community college educator, one K–12 educator, and one graduate student. The external advisers earned a stipend and ASPB membership for their efforts. Together, the team of eight worked to read, evaluate, align, edit, and expand the 12 Principles of Plant Biology. They focused on alignment with the NGSS, which is now divided into four categories: from molecules to organisms, ecosystems, heredity, and biological evolution. The team also considered the AP Biology standards. Upon completion of their work, the advisory committee shared the results with the Education Committee, who

provided additional feedback and revisions. The Principles for Teaching Plant Biology were shared with ASPB members early in 2022.

As a key companion to the Principles for Teaching Plant Biology, a set of classroom activities and labs is being created to accompany each principle, with multiple versions to be tailored to different student age groups. We used the 2022 Plant BLOOME grant program to fund the development of three such projects, described on pages 19 and 20, and will continue to identify needs and solicit activity development in the future.

We launched the Principles for Teaching Plant Biology externally to educators at the National Science Teachers Association (NSTA) conference this spring to share the content, seek feedback on dissemination preferences, and urge NSTA members to join ASPB and develop Plant BLOOME proposals. We will continue to share the principles and solicit the development of additional materials at NSTA and other education professional development conferences, such as the National Association of Biology Teachers conference this fall. ASPB members and nonmembers alike will be able to access the Principles for Teaching Plant Biology and corresponding activities and labs on ASPB's online channels.

## Special thanks to the following individuals for their invaluable contributions in revising the Principles for Teaching Plant Biology:

### ASPB Education Committee members:

Susan Bush, Metro State University

Katelyn Butler, Vassar College

Ashley Cannon, USDA ARS

Jonathan Gilkerson, California State University, Sacramento

### External advisers:

Paul Bilinski, West Shore Community College

Amy Dykstra, Bethel University

Robert Kennedy, Tenafly High School

Ka Man Jasmine Yu, Texas A&M University

# Principles for Teaching Plant Biology

## Heredity

### Central Dogma

Plant traits are dictated by genes, which direct the synthesis of RNAs and proteins.



### Transmission Genetics

DNA, stored as chromosomes, is the genetic material of plants and is inherited from one generation to the next via sexual or asexual reproduction.



### Population & Quantitative Genetics

Phenotypic variation of many traits depends on the interaction of genotypes and environmental factors.



### Alternation of Generations

Plant reproduction is characterized by the property of the alternation of generations.



### Breeding

Selection of particular plant phenotypes has been integral to the development of human society, as it is the basis for plant breeding and agriculture.



## Evolution

### Species Biodiversity

Plant biodiversity can be seen at the genetic level, the species level, and the ecosystem level.



### Common Ancestry

Land plants evolved from water-dwelling algae-like ancestors that could perform photosynthesis.



### Natural Selection

The cells of all living organisms, including plants, contain DNA as their genetic material.



### Environmental Response

Plants live in and have adapted to a wide variety of environments.



## Molecules to Organisms

### Photosynthesis

During photosynthesis, plants convert energy from sunlight to produce sugars from carbon dioxide, providing energy and carbon to the plant and the biosphere.



### Phytohormones

Throughout a plant's life cycle, plant hormones are essential for growth, development, and responses to the environment.



### Specialized Metabolites

Plants produce specialized compounds that provide an advantage to the organism in their environment even though they are not required for growth and development.



### Cell Walls

Cell walls provide plant cells with support and protection against mechanical and osmotic stress.



### Development

Plants have special areas that contain stem cells. These cells continuously divide to help the plant grow and can become many different organs.



## Ecosystems

### Biogeochemical Cycles

Plants, as primary producers, play an essential role in nutrient cycling through the biosphere.



### Impact of Biodiversity

Plants are key to maintaining complex natural systems.



### Ecosystem Services

Plants provide many supporting, provisioning, regulatory, and cultural ecosystem services.



## The Perfect Pairing: Science and Art

BY JENNIFER ROBISON  
Manchester University



Nervous tissue created by students out of pipe cleaners, straws, modeling clay, beads, and pompoms.

Science and art are often thought of as opposites—people are considered to be either science minded or art minded—but the reality is that science and art complement each other profoundly. The two disciplines are both based in creative explorations of the world we inhabit. For hundreds of years, people could be both a scientist and an artist; Leonardo da Vinci, Elizabeth Blackwell, Marianne North, and Hedy Lamarr are just a few. Plant biologists continue to do so; we all use visualizations of our data in talks and publications, and effective data visualization is an art form. Having students generate an artistic representation of a concept is a way to help them relate what they are learning in a format that is more tangible and often more personal. In my courses, I have found art-based activities to be an effective way to improve student engagement with and comprehension of the material.

One of my favorite activities is to provide art supplies (e.g., modeling clay, pipe cleaners, pompoms, beads, paper plates, straws) for students to create physical representations of cellular- and molecular-scale processes. Students build tissues, create signaling pathways, and compare morphologies, among other things. Most of these activities are done during classroom sessions.

In several classes, I have turned art-based activities into what I call “interactive

quizzes.” Instead of a normal multiple choice or short-answer quiz, I assign students a task to complete, such as building a molecular pathway with art supplies, to be followed by class discussion and a personal reflection on the activity. These interactive quizzes have been well received by students; they have found the format enjoyable and felt they learned more than with traditional quizzes. Instead of cramming for a quiz and then promptly forgetting what they “learned,” students have found that the material they prepared with this unique format stayed with them. One student reported that they “enjoyed how we got to build it out of materials; it’s funny how those activities are the ones that stick in your head the most.”

The most focused art-based project I use is based on the “unessay” format, in which students must convey similarities and differences between two microbes in a creative format. The rules are simple: they must create a piece of “SciArt” (science demonstrated as art) to compare and contrast the microbes. In this particular assignment, the sky is the limit, which is both inspiring and intimidating to students. Over the three years I have been using this assignment, students have created drawings, paintings, graphic designs, crocheted plushies, sculptures, wood carvings, cakes, rap songs, fingernail art, T shirt designs, and game cards. On the assign-

ment due date, I hold a Microbial Science Art Show, and each student displays and describes their piece. When I analyzed students’ reflections on this activity for recurring themes, I saw that more than half reported that this activity helped their understanding by forcing them to think more deeply. One student noted, “This process helped me understand the material better by forcing me to explain it in a way that I normally would not, so I had to put extra thought into how this project would come across to others.”

It was clear from students’ feedback that they were more engaged and felt they were learning more by participating in a Sci-Art project. But I couldn’t help but wonder whether their learning gains were improved by this process. With that in mind, I designed a pre- and posttest to gauge the effect of an unessay versus an essay assignment. Using two cohorts, I saw that students in the unessay cohort had a higher mean and narrower range in their learning gains compared with the essay cohort. These data supported my decision to continue using art-based projects in my courses. I am writing a paper on the quantitative and qualitative value of using art in courses that will examine these data in greater detail.

Art is an exploration of the world through subjective and qualitative forms. Sci-

*continued on page 20*

## Plant BLOOME 2022 Winners Announced

**A**SPB established the Plant Biology Learning Objectives, Outreach Materials, & Education (Plant BLOOME) grant program with the goal to enhance public awareness and understanding of the essential roles of plants in all areas of life (<http://bloome.aspb.org>). Congratulations to the 2022 ASPB Plant BLOOME grant recipients!

### Plant GIFTS: Genetics in Farming Technology and Science

**Co-PI: Mindy Findlater**

*University of California, Merced*

**Co-PI: Erin Friedman**

*University of Lynchburg*

Plant scientists are working hard to help meet global food production challenges, and the genetics and plant breeding techniques involved in these projects are fundamental, essential, and frequently misunderstood by the public. Misinformation on the genetic modification of crop plants can be found everywhere, and we hope to help students gain an understanding and appreciation of basic genetics, plant breeding, and crop genetics through the lens of current food production challenges.

This teaching module will be based on active learning techniques that instructors can use with advanced high schoolers and early undergraduates. The module will require minimal materials, so it can be easily implemented in any size classroom.

### An Inquiry-Based Module for Exploring Student Conceptions of Plant Circadian Rhythms, Gene Expression, and Defense Against Insects

**Co-PIs: Jeremy Hsu and Hagop Atamian**

*Chapman University*

Many students perceive plants as static and do not recognize that plants are incredibly dynamic in many ways. For example,



Mindy Findlater



Erin Friedman



Jeremy Hsu



Hagop Atamian



Erin Rehrig



Katharine Covino

students tend to have trouble conceptualizing the malleable nature of gene expression and the ways environmental factors can influence it. We will develop a hands-on experimental module based on research examining circadian rhythms in cabbage from grocery stores. Students will conduct experiments to investigate how environmental cues impact gene expression and herbivory of these plants. Students will be challenged to think critically throughout the process and as they analyze and evaluate their findings.

We are grateful for the support of the Plant BLOOME grant, which will enable us to integrate this module in partnership with several local high schools to promote knowledge and interest in plant biology. The grant will also support our curricular development, as well as assessment and dissemination

of the materials to ASPB members and the broader plant and biology education communities.

### Shining a Light on Plant Blindness: Using Kenneth Oppel's Young Adult Novel *Bloom* as a Motivating Tool for Teaching Plant Science to First-Year Undergraduate Students

**Co-PIs: Erin Rehrig and Katharine Covino**

*Fitchburg State University*

It has been over 20 years since the term *plant blindness* was coined to explain the overall educational apathy toward and lack of appreciation for plants. The goal of our project is

*continued on page 20*



Art created by microbiology students for the SciArt show.

ence is an exploration of the world through objective and quantitative forms. But both require creativity, problem-solving skills, communication skills, and practice. My experiences indicate that combining art and

science has a profound effect on students. I'd like to challenge you to incorporate art into your classrooms so that you can see the effect firsthand. If you have questions during your SciArt teaching journey, please do not

hesitate to reach out to me (JDRobison@manchester.edu). If you already use SciArt in your teaching or if you try it because of this article, I'd love to hear about your experience!

## PLANT BLOOME WINNERS continued from page 19

to make first-year college students interested in, knowledgeable about, and appreciative of plants using the young adult novel *Bloom* by Kenneth Oppel (Knopf, 2020). Because the book is highly exciting, intricately plotted, and well researched, it can be used as a literary tool to motivate students to learn about topics such as photosynthesis, plant growth and development, and invasive species. We find the serendipity of receiving a Plant BLOOME grant using the book *Bloom* somewhat whimsical, too!

In many ways, *Bloom* encourages students to envision plants as active participants in the ecosystem rather than as nonliving or uninteresting organisms. The curriculum supported by this grant will help students engage with and apply the botanical concepts they

encounter as they read the book. Additionally, as students connect with the three teenage protagonists, they will discuss the topics of belonging, fitting in, and personal growth, providing opportunities to communicate their own anxieties about their first year at college.

The curriculum is based on constructivist learning models in which students are actively engaged in their own learning process through hands-on activities. Several lessons are also inquiry based, and students

will learn the process of science by testing hypotheses, collecting and analyzing data, interpreting results, and communicating those results in a lab report. By also incorporating STEAM (STEM + Art) activities, including a mock podcast in which students act as plant experts and the opportunity to “terraform” their classroom to look like the alien setting of the book, we hope to tap into students’ different talents and foster creativity in the classroom.



## Win a Plant BLOOME Grant!

The next application period opens Spring 2023. Visit [bloome.aspb.org](https://bloome.aspb.org) to stay updated.

# Announcing the 2022 ASPB Summer Undergraduate Research Fellows

The ASPB Summer Undergraduate Research Fellows (SURF) program funds promising undergraduate students so they can conduct research in plant biology during the early part of their college career over the course of 10 consecutive weeks. This year's SURF recipients will present their research at Plant Biology 2023. Congratulations to the 2022 ASPB Summer Undergraduate Research Fellows and their mentors!

## SURFers from Primarily Undergraduate Institutions



**Hisham Tadfie**  
Williams College

**Project:** *Biochemical investigation of N-methyl anthranilate synthesis in Ruta graveolens*

**Mentor:** Cynthia Holland

I am in a position of tremendous privilege to be able to pursue a higher education in science, and I am grateful to ASPB for granting me a SURF award. I will have the opportunity to

develop my undergraduate research skills this summer and to share the findings of my research with the broader plant biology community next year. I am excited to begin my research.

## SURFers from Doctoral-Granting Institutions



**Kristen B. Barwick**  
University of Missouri

**Project:** *Expressing and purifying the Arabidopsis EPSIN1 ENTH domain for antibody production*

**Mentor:** Antje Heese

I am honored and blessed to receive the ASPB SURF award, which will enable me to increase my research experience in preparation to pursue a graduate degree in the future. Per-

forming this research will give me invaluable skills in networking with other professionals in plant biology, presenting my research to fellow scientists, and planning and performing procedures in the lab. With the help of this fellowship, I will become an overall better researcher while diving deeper into my project of interest. I cannot wait to share my results!



**Denzel dos Santos e Silva**  
University of São Paulo

**Project:** *Does gravity/microgravity affect the function of the plant circadian clock?*

**Mentor:** Colleen Doherty

Receiving the ASPB SURF award is, with no doubt, the biggest opportunity I've had since I started my degree. With this award, I'll have a chance to improve many skills in my desired

research field in another country with a renowned researcher. These experiences will help me define my career goals in research while I meet new people with a different culture from Brazil.



**Anne L. Gilland**  
University of Vermont

**Project:** *Testing alternative splicing and intron importance in the LATD/NIP gene of Medicago truncatula*

**Mentor:** Jeanne M. Harris

I am honored and excited to be able to continue my research this summer, thanks to the support of the ASPB SURF grant and my mentor. I look forward to learning new skills, inves-

tigating new questions, and making progress toward a greater understanding of plant biology. I'm very grateful for this opportunity.



**Sarah E. Hale**  
University of Idaho

**Project:** *The effects of Meloidogyne chitwoodi infection on gene expression in Solanum sisymbriifolium*

**Mentor:** Joseph Kuhl

I am grateful to be one of this year's recipients of the ASPB SURF award. This opportunity has already taught me so much about the process of research, and I am eager to use the

lessons and connections I acquire through this opportunity to guide my career beyond undergraduate studies.

*continued on page 22*

2022 SURF WINNERS  
continued from page 21



**Erica Lin**  
University of Miami

**Project:** Investigating the role of receptor-like kinases in arbuscular mycorrhizal symbiosis

**Mentor:** Lena M. Mueller

The ASPB SURF award will allow me to complete my own large-scale research project for the first time. Throughout this project, I will further my knowledge of arbuscular mycor-

rhizal symbiosis in *Medicago truncatula* and learn new skills that will aid my goal of attending graduate school.



**Anwen Roberts**  
University of Vermont

**Project:** Characterizing a newly identified function of *CCDC93* and its role in *Arabidopsis* seedling growth

**Mentor:** Mary L. Tierney

I am honored to receive the ASPB SURF award and excited about the opportunities it is giving me. This award will allow me to continue my research in endosomal trafficking

in *Arabidopsis thaliana*, bringing me invaluable skills for graduate school and my future career. I look forward to going to the ASPB annual meeting next year to present my work and learn about exciting, cutting-edge research occurring in plant biology.



**Lauren N. Velie**  
University of Massachusetts Amherst

**Project:** Understanding the role of aldo-keto reductase family 4C in nitric oxide homeostasis in *Arabidopsis thaliana*

**Mentor:** Elizabeth Vierling

I am honored to receive the ASPB SURF award, which will allow me to advance my project exploring dynam-

ic systems that enable plants to grow and respond to environmental change. This opportunity will help me mature as a scientist in my own right, and it offers me invaluable experience that I will take with me into graduate school and beyond.

### Honorable Mentions

ASPB receives many competitive applications for a limited number of SURF awards, and the SURF Committee deemed two declined applications to be meritorious and deserving of partial support. The SURF program will offer these applicants cost-free registration for Plant Biology 2023 and a waiver of the abstract submission fee if they are able to find other support for their summer research in 2022.

**Madison N. Blea**  
University of Nevada

**Project:** Characterization of the localization and interacting partners of putative Rumi-like glycosyltransferases in *Arabidopsis thaliana*

**Mentor:** Ian S. Wallace

**Anna L. Childers**  
Butler University

**Project:** Exploring the role of disordered regions in cellular location and behavior of *Arabidopsis thaliana* transcription factor *TCP8*

**Mentor:** Benjamin Spears



### Join the next class of SURFers!

The next application window opens January 2023.

Stay updated on grants and funding opportunities at <https://aspb.org/awards-funding/grants-funding/>.

## That's a Wrap on Plant Biology 2022

The first in-person event since 2019 saw engaging science and a connected community. On Saturday, July 9, ASPB, together with the Canadian Society of Plant Biologists (CSPB/SCBV), kicked off Plant Biology 2022, welcoming more than 1,000 plant biologists to Portland, Oregon, for five days of leading-edge scientific content, thoughtful discussions about engaging scientists around the world, and long-missed networking and camaraderie.



### First-Ever Plant Science Saturday

Plant Biology 2022 featured the first annual Plant Science Saturday, a community engagement event designed to educate members of the broader Portland community about plant science and what plant scientists do and to open children's minds to considering plant science as a career. Planned by ASPB's Education Committee, the event was made possible by more than 50 volunteers placed at interactive stations where community participants could dissect lima beans, create a seed cup necklace, talk to a plant scientist, learn more about influential Black plant scientists courtesy of an art display by Carnegie's Plant Cell Atlas, sample genetically modified foods provided and served by the Alliance for Science and Modified Foods, and more. Participants who visited each station received a stamp in a field journal-style passport; a completed passport earned participants a certificate and Junior Plant Scientist badge.

"Bringing this event to Portland was the realization of a desire to give back to the cities we visit," said Erin Friedman, chair of the Education Committee. "The turnout was great, and we look forward to applying the framework developed for this year's event to future Plant Biology meetings to make an even bigger impact."

### Comprehensive Program

Plant Biology featured five plenary symposia, 30 concurrent symposia, seven virtual-only workshops, three award talks, and 23 in-person workshops covering everything from novel science to career development. The ASPB and CSPB/SCBV Equity, Diversity, and Inclusion Plenary, "Science Without Borders: Migration, Domestication, and Culture," chaired by Marcus A. Samuel, was a highlight of the conference for many attendees because of its diverse content and unique presentation.

In addition to the scientific content, events such as the ASPB African Researchers Network Hackathon and the ASPB Early Career Plant Scientists Section's Three-Minute Thesis competition brought a competitive edge to Plant Biology 2022. These high-energy events let participants share their talents and expertise with other attendees in new ways.

### Vibrant Networking

Although the scientific content is the main draw of Plant Biology, every day saw many opportunities for attendees to connect with old and new friends and meet key members of ASPB and its committees, journals, and other activities. The Innovation Pavilion, sponsored by Bayer, served as a flexible space for meetups and games, important discussions, a Meet the Editors event to engage with editors from *Plant Physiology* and *The Plant Cell*, and a popular "How to Write a Successful BLOOME Proposal" session hosted by Erin Friedman and ASPB Education Coordinator Winnie Nham. Additional meetups included an LGBTQ+ Plant Scientists meetup, a Twitter meetup to connect some of the 21,000+ plant scientists interacting with ASPB and each other on Twitter, and an ASPB Plantae Fellows meetup. At the annual party featuring Society-favorite band The 9s, attendees rocked the night away.

See you next year!

Plant  
Biology

2023 | SAVANNAH, GEORGIA  
AUGUST 6 - 10

# #PlantBio2022 In Tweets

*This year's meeting lit up Twitter*



PLANT  
BIOLOGY  
2022



SCAN ME

## No Twitter? No Problem!

Catch up on everything that went down on the official Plant Biology hashtag at <https://bit.ly/3Ptlovf>.

PR215M  
@Pr215m

Whoa! 🎉 Congratulations @UWBotheil @UWB\_STEM @UW @thelma\_madzima on this double @ASPb honor! 🌟🌟🌟🌟🌟

#PlantBio2022 #BlackandSTEM

Gustavo MacIntosh @GMacIntosh · Jul 9  
wow, @thelma\_madzima getting not one but 2 (twice) awards at @ASPb #PlantBio2022, nobody more deserving, and likely the first time somebody is a double ASPb awardee 🌟🌟🌟🌟



9:04 PM · Jul 9, 2022 · Twitter for Android

Edel Pérez López  
@Edel\_P\_Lopez

That's a wrap! This was my first #PlantBio2022 and couldn't find a better way to introduce myself. I'm thankful and overwhelmed by the support, didn't expect to touch so many hearts 🌱 While the science was AWESOME, the new friendships were the highlight! Can't wait to see you 🌱



Thelma Madzima, Ph.D and 8 others

3:37 PM · Jul 13, 2022 from Portland, OR · Twitter for iPhone

Elena A. Pelech  
@ElenaPelech

LOVED my first @ASPb #PlantBio2022 conference, powerful talks & workshops, exciting research, reconnected with coworkers, made many new friends & finally met fellow ASPb ambassadors. Thank you @RIPEproject & poster coauthors Sam Stutz @YuWangcn @Liana\_Ace @shelle\_wall @LongLab

4:08 PM · Jul 13, 2022 · Twitter for Android

Abdul Latif Khan  
@khanlatif

#PlantBio2022 was awesome. Met so many fellow scientists, a few collaborations, a lot more new ideas, and importantly a few tips on grant submissions from NSF directors.

Must appreciate @UHCOT for supporting my conference travel.

@ASPb #GoCoogs



8:24 PM · Jul 12, 2022 · Twitter for iPhone

Ritesh Kumar  
@kumar2501

We had a wonderful session: Gene Editing Breakthrough with our chair @francescablopez and speakers @TrevorWeiss480 @Pjenomics @ASPb @kumar2501 #PlantBio2022 @UMNews @umncbs @friendzhang



8:46 PM · Jul 12, 2022 · Twitter for iPhone

# SOCIETY NEWS



# 2022 PLANT BIOLOGY

# 2022

PLANT BIOLOGY

## Session Recap

## From Plant Biology 2022: What Now?

Working toward global solutions together

BY KRISTEN VAN GELDER  
University of Florida

**P**lant Biology 2022 was my first time attending an ASPB conference, and I didn't quite know what to expect. What I was pleasantly surprised to find was a diverse group of scientists from all over the world, and many of those who took the stage in award talks and plenary and concurrent sessions were students, early career scientists, and BIPOC (Black, Indigenous, and People of Color). When Katie Dehesh, ASPB president, opened the conference at noon on Saturday, July 9, I felt excited. Here we were, a group of diverse scientists, some of whom had spent their lifetime carving a path of great discoveries and solid science, interspersed with young people, ready to forge their own unique paths and tackle the problems of the future. I expected a grand call, an inspirational speech about how we, young and old, could use our science to fix the world. With climate change as the most pressing issue ahead of us and plant science and agriculture being so central to the solution, I expected many invited speakers to showcase how their work was involved in finding those solutions.

Climate change was not on the agenda for the president's plenary session on RNA biology, though. Although there is a lot of emerging and groundbreaking research in RNA, particularly within the past few years (e.g., mRNA vaccines), and the plenary talks were great and left me with questions to ponder for my own research, I was a bit disappointed. I wondered if maybe I was just too narrow-minded, or presumptuous in thinking that climate change and sustainability were the leading topics on everyone's minds. However, as the conference progressed, I realized that these topics were, in fact, inspiring much of the work presented at Plant Biology 2022.

Underlying many presentations, posters, and workshops was this drive to find solutions to climate change. Maybe they didn't say it outright, but it was there: plant immunity, plant-abiotic interactions, metabolism, and even plant space biology. Much of the research we in the plant science community are undertaking will lead to solutions for climate change, particularly in building resilience in crops for a planet that is getting hotter and drier and facing diminishing soil vitality. I realized then that a grand call to action wasn't necessary. Because here we were, hundreds of scientists already deeply entrenched in the battle.

I left the conference hopeful about what I and other young scientists can achieve in the coming decades. But I also realized that we cannot get complacent. There are many challenges ahead of us that we must act on now; here are three of them:

### 1 Restructuring science communication within our community and with society at large

Most people don't have access to scientific articles or the training to understand them. We need to make science more accessible to both nonacademic researchers and laypeople (e.g., farmers), and part of that includes restoring society's trust in scientists.

### 2 Reenvisioning how we train young scientists

Allison McDonald gave an excellent presentation on problems in academic training and how we fail our students. To that I add that students need to be equipped with the skills and knowledge to tackle future problems. They need to be taught how to communicate their science and to be shown the wealth of opportunities they have beyond academia.

### 3 Refocusing plant science to tackle emerging problems while also leaving room for basic research

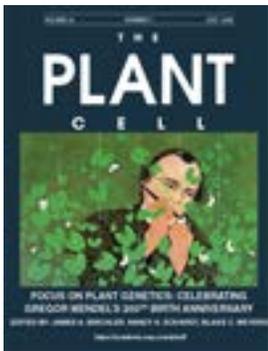
A lot of scientists get stuck in their research silos. More effort needs to be put into interdisciplinary research, combining the knowledge of chemists and physiologists, microbiologists, and crop scientists. Together, we solve problems. Alone, we get lost in the minutiae.

Read more recaps from Plant Biology at [blog.aspb.org](http://blog.aspb.org)!

## From ASPB Journals

### Latest Focus Issues

#### **The Plant Cell: Focus on Plant Genetics: Celebrating Gregor Mendel's 200th Birth Anniversary (July 2022)**

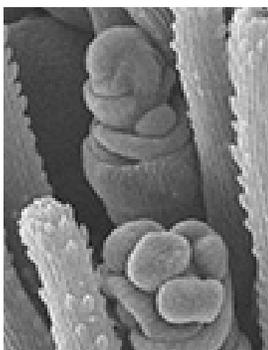


**Focus Issue editors:**  
James A. Birchler, Nancy A. Eckardt,  
and Blake C. Meyers

We celebrated Mendel's birthday and his achievements, along with recent advances in plant genetics, by inviting leading plant geneticists to review their areas of expertise. This collection of three perspectives and six review articles mixes musings and historical perspectives on Mendel's work, including the

fates of gene duplications, chromosomal fusions and the evolution of eukaryotic genomes, plant telomere biology, the classic morphological mutants of maize, the genetic control of inflorescence architecture in the grasses, leaf developmental genetics, and the evolution of bread wheat. Thought-provoking perspectives articles highlight the importance of Mendel's extensive preparation and thoughtful experimental design, completed before conducting his famous crossing experiments, and imagine what field of research Mendel might choose today, linking his 19th-century masterpiece to contemporary plant molecular biology and highlighting his neglected and misunderstood later work on *Hieracium*.

#### **Plant Physiology: Focus Issue on Evolution of Plant Structure Function (September 2022)**



**Focus Issue editors:**  
Elizabeth A. Kellogg, Jill C. Preston,  
Neelima R. Sinha, and Keiko Torii

Plant morphology, physiology, and development are shaped by a combination of internal, external, and historical factors that have led to the remarkable diversity of structure and function we observe on Earth today. Recent progress in understanding the proximate basis of plant evolution has revealed a

myriad of underlying mechanisms, ranging from the genetic and epigenetic to the biophysical and microbiotic. This focus issue, due to be published in September 2022, provides novel insights into evolutionary mechanisms underpinning plant phenotypic variation and comparisons of disparate organisms (from between species to between kingdoms).

### Save the date for this Focus Issue Webinar!

Friday, September 16  
8 AM EDT, 2 PM CET  
Speakers: Aurélia Emonet,  
Camille Puginer, Jill Preston  
Moderator: Mateusz Majda

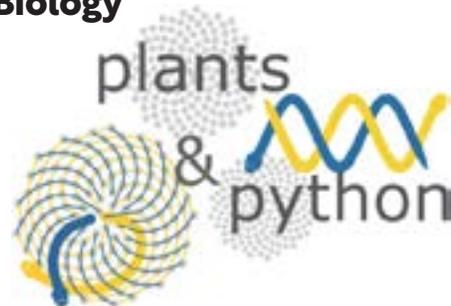


### Submissions Are Open for Upcoming Focus Issues

*The Plant Cell* has focus issues planned for 2023 on climate change and plant stress, RNA biology, and biomolecular condensates. *Plant Physiology* focus issues will address respiration, plant cell polarity, and fruit crops. Submissions to focus issues for both journals remain open for several months past the given deadline; manuscripts accepted too late for publication in a focus issue will be added to a focus collection on the topic to be assembled at a later date.

Submit your paper for an  
upcoming Focus Issue  
at <https://bit.ly/3xQW1NT>.

### Now Available! New Teaching Tools in Plant Biology



#### **Plants & Python: A Series of Lessons in Coding, Plant Biology, Computation, and Bioinformatics**

Designed by Robert VanBuren, Alejandra Rougon-Cardoso, Erik J. Amézquita, Evelia L. Coss-Navarrete, Aarón Espinosa-Jaime, Omar Andres Gonzalez-Iturbe, Alicia C. Luckie-Duque, Eddy Mendoza-Galindo, Jeremy Pardo, Guillermo Rodríguez-Guerrero, Pablo Y. Rosiles-Loeza, Marilyn Vásquez-Cruz, Selene L. Fernandez-Valverde, Tania Hernández-Hernández, Sourabh Palande, and Daniel H. Chitwood

Announced last issue, the latest Teaching Tool is now available in the July issue of *The Plant Cell*. "Plants & Python: A Series of Lessons in Coding, Plant Biology, Computation, and Bioinformatics" teaches

coding learning objectives in Python, a general programming language, using data sets and mathematical examples inspired by plants. Whether used in a classroom or for self-directed learning, the lessons cover coding essentials in Python, ways to use a UNIX command line, and bioinformatics. Whether learners are interested in plant biology or computational science, whether they come to these lessons speaking English or Spanish, Plants & Python provides them with a starting point for interdisciplinary and intercultural collaboration in the plant and computational sciences.



Find the latest Teaching Tools in Plant Biology at <https://bit.ly/3OG8B8w>.

### **Plant Physiology Assistant Features Editor Application Window Closes October 3, 2022**

*Plant Physiology* is recruiting a new cohort of Assistant Features Editors to join the *Plant Physiology* editorial board to replace those who will step down at the end of 2022. This new cohort will work with the journal for 24 months beginning in January 2023. If you are interested in becoming an Assistant Features Editor, applications are being accepted through Monday, October 3, 2022.

Application materials may be submitted to [PPAFEapplications@aspb.org](mailto:PPAFEapplications@aspb.org), with “Plant Physiology AFE application” as the subject. These materials should include the following:

- cover letter
- CV
- contact information for two referees
- PDF of first-authored paper
- sample News and Views-style article highlighting a paper listed at <https://plantae.org/plant-physiology-is-recruiting-assistant-features-editors-for-2023>. Note: If you have difficulty accessing the paper you would like to write about, please email Mary Williams at [mwilliams@aspb.org](mailto:mwilliams@aspb.org).



Read more about being an Assistant Features Editor at <https://qrco.de/bdCBNf>.

### **An In-Person Affair to Thank Mike Blatt**

*Plant Physiology's* Former Editor-in-Chief Recognized at This Year's Editorial Board Meeting

On July 8, 2022, just prior to the start of Plant Biology 2022, the editorial board of *Plant Physiology* gathered in Portland, Oregon, to strategize, engage in big-picture conversations about the journal, and network with colleagues from around the world. This proved to be an ideal venue to recognize the many contributions of Mike Blatt, who served as Editor-in-Chief of *Plant Physiology* from 2013 until the end of 2021 and remains active on the Editorial Board.

“As soon as Mike stepped into the role, he immediately brought fresh ideas, fresh thinking, and the remarkable energy that he somehow managed to sustain unabated for his 9 years at the helm, even after a skiing accident literally knocked both legs out from underneath him,” said Crispin Taylor, ASPB CEO during the acknowledgement speech at the event. “Through it all, Mike has been an affable, thoughtful, and refreshingly direct colleague firm in his commitment to the issues that are important to him and considerate in all things.”

Mike was gifted a painting as a token of ASPB's gratitude for his extraordinary commitments to ASPB and *Plant Physiology*.



Mike Blatt (right) and Crispin Taylor during the acknowledgment event in Portland, Oregon.



Read Mike's final editorial in *Plant Physiology* <https://bit.ly/3QlHNei>.

### ASPB Thanks Ivan Baxter Founding Editor of *Plant Direct*

While plant biologists have journals from which to choose to publish their work, in 2017 there was a gap in the plant biology journal landscape: that of a sound science journal driven by the plant biology community. Ivan Baxter brought forth the shared vision of ASPB, the Society of Experimental Biology (SEB), and Wiley as founding Editor-in-Chief of *Plant Direct*.



“*Plant Direct* is a society journal, and we think the service to community part of our mission statement is incredibly important,” Ivan wrote in his inaugural editorial in June 2017. “When the community is doing the work, the community should reap the benefits.”

During Ivan’s tenure, *Plant Direct* experienced notable growth and innovation. Under his direction, *Plant Direct* launched its Associate Reviewer Board (ARB) initiative, which identifies community members with experience as reviewers and who want to expand their participation with the journal, and provides training and mentoring in reviewing for community members. Ivan also introduced new content types to *Plant Direct*, accepting white papers and workshop reports, and oversaw the addition of *The Journal of Experimental Botany* as a partner journal, making it possible for authors to transfer declined manuscripts to *Plant Direct* with the click of a button.

In his five years at the helm of *Plant Direct*, Ivan guided an idea to a reality, with 338 original research papers published by authors from 36 countries. “Our authors were able to make an impact with their research while supporting the activities of two important plant societies. I count that as an unqualified success,” Ivan wrote in his final editorial, published in March 2022.

Ivan, thank you for your years shaping *Plant Direct* in service to the plant biology community.



### *Plant Physiology* Assistant Features Editors and Editors Collaborate on Profiles

Last issue, we shared the upcoming editor profiles that would be launching on the Plantae blog. Kicking off with a profile of *Plant Physiology* Editor-in-Chief Yunde Zhao, by Sjon Hartman, the profiles are a unique and fun partnership for members of the journal’s Editorial Board to work together, get to know each other, and help the plant science community learn more about the people keeping the journal going.

#### Three more profiles are available online now:

- “From Editor to Teacher: Views from Both Sides of the Scientific System. An Interview with *Plant Physiology* Monitoring Editor Prof. Ronald Pierik, PhD” by Guada Fernández-Milmanda
- “An Interview with Pierdomenico Perata, PhD, Monitoring Editor of *Plant Physiology*,” by José Manuel Ugalde
- “About Life and Science: An Interview with *Plant Physiology* Monitoring Editor Prof. Christian Fankhauser, PhD,” by Jathish Ponnu



Follow the profiles and discover the interesting stories of the scientists behind *Plant Physiology* at <https://bit.ly/EditorProfiles>.



# Plantae

## Happening on Plantae



### Pride Month Blog Series

The LGBTQ+ Plant Scientist Network (@LGBTQPlantSci) hosted an excellent blog post series for LGBTQ+ Pride Month on Plantae. Seven articles by early career researchers explore the intersection of plant science and being LGBTQ+. Contributors range from ecologists to molecular biologists from across the United States and the United Kingdom. They discuss recommendations for making fieldwork more inclusive for LGBTQ+ folks, pros and cons of graduate school in the United Kingdom, stories of coming out or transitioning in graduate school and how people navigated those processes, and explorations and discussions of plant science and queerness. These posts highlight the diversity of LGBTQ+ experiences in plant science as we work to make our field more inclusive and accepting and one that celebrates and values all people.

The blog post series can be found at <https://bit.ly/LGBTQPlantSci>. We hope you enjoy reading and learning from this excellent group of scientists!

### Check Out Plantae's Job Board

<https://jobs.plantae.org/>



SCAN ME



### Plantae Fellows



Plantae Fellows are highly engaged contributors who help nurture the Plantae community by curating content and facilitating discussions. In June, the 2022 Plantae Fellows met to continue their collective work toward making Plantae one of the leading global platforms and online communities for plant scientists and enthusiasts. Stay updated at <https://plantae.org>.

### Plant Science Research Weekly



Plantae editors highlight new plant science research articles with short summaries that describe key findings with links to full articles. Get this exciting roundup of plant science research delivered right to your inbox. Subscribe at <https://plantae.org/research/wrwtw/>.

# 5

## Actions to Get More Value from Your ASPB Membership

# 1

### Search the Member Directory for colleagues.

Sign in to the Member Portal and click on the Member Directory in the top menu.

# 2

### Apply to join a committee.

Sign in to the Member Portal and click on Serve on a Committee in the top menu.

# 3

### Read *Plant Physiology* and *The Plant Cell*.

Sign in to the ASPB site using your member username and password.

# 4

### Update your profile.

The more we know about you, the better we can target our emails and programming to your interests.

# 5

### Nominate a fellow plant scientist (or yourself).

Nominees are needed every year for ASPB leadership positions and named awards.

Learn more about ASPB benefits at <https://aspb.org/membership/>.

Access the Member Portal at <https://members.aspb.org/s/>.

Have a question? Contact [info@aspb.org](mailto:info@aspb.org).

## *Plant Physiology*<sup>®</sup>

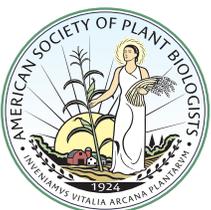
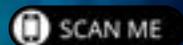
CALL FOR PAPERS

### 2023 Focus Issue on **Cell Walls**

**Submission Deadline:** February 28, 2023

**Publication:** November 2023

LEARN MORE AT <https://qrco.de/bdF4hx>



ASPB staff are dedicated to serving our members.  
We welcome your questions and feedback.

**For quick response, email us at [info@aspb.org](mailto:info@aspb.org).**