

# Public and Leaders Events: A Conversation with ROOT & SHOOT RCN about Equity in Plant Science

On April 12 and 14, the ROOT & SHOOT RCN held four, hour-long on-line conversations about equity in plant science. Two of these sessions were open to all, and two were by invitation only for people who hold leadership positions within the plant science organizations that are part of the RCN.

We provided the participants with a set of breakout room topics based on thematic areas that were identified during registration for the event. A brief overview of the ROOT & SHOOT RCN was given, then participants were asked to self-select into a breakout room of their choice. There, they had access to a Google Doc, which had a prompt (shown in blue below each header) and three questions to guide the discussion, along with spaces to take notes. After twenty minutes, participants reconvened in the main room, where volunteers from each room reported on what was discussed and shared the group's key issues and recommendations. (Note – many participants reported that 20 minutes was not enough time for discussion).

The notes from these four rounds breakout groups are compiled below (very lightly edited to correct typos). Some topics were selected less often and so have fewer comments and recommendations than others.

The goal of these events was to begin the process of conversing about equity and inclusion in the plant sciences and to build awareness of the different ways that individuals experience professional spaces. These collective insights provide entry points from which the RCN can focus the efforts of Working Groups.

The topics provided for discussion are listed below. We also provided an optional safe-space breakout room, which was not used.

- Pipeline and representation
- Work-Life balance
- Inclusive culture / discrimination
- Leadership / funding / awards
- International & immigrant Issues
- Issues affecting LGBTQ+ population
- Culturally responsive mentorship
- Inclusive conferences
- Accessibility and ableism
- Publishing and authorship
- Gender bias

## Pipeline and representation

We need to create an environment in which everyone feels welcome, supported, and able to perform to the best of their abilities. Studies have repeatedly shown that if students do not see

themselves **represented** at higher levels of academia, they are much less likely to continue in that field. Pipeline issues are not simply due to a lack of representation, but also reflect a culture with rules and policies that often represent unnecessary barriers for underrepresented groups.

### **What are some of the equity challenges that pertain to pipeline and representation?**

- What makes societies/organizations an attractive place for marginalized groups, and how do we do that?
- Getting students into STEM at the undergrad level, to start with! So many issues associated with this (teaching tools, opportunities, exposure to plant scientists)
- HBCUs have lots of students interested in biology, but students are often unaware of plant biology. They want to do medicine to help people, without realizing that plant biology can do the same. One way to get STEM HBCU students interested in plant biology could be to focus on the ways plant biologists “save the world”.
- HBCUs have enormous teaching loads (12-15 credits per semester). There is not time to write grants, even though HBCUs have access to lots of potential students.
- We want to change the word “pipeline” to “pathway” or “obstacle course”. In a sense a pathway with obstacles in the way for some more than others.
- What are the obstacles: Unpaid research – economics become a barrier to participation. The economic barrier is disproportionately impactful to poor students. First generation students and underrepresented groups, beyond economic circumstances alone, can lack support within the system as well as from their social and family circle for pursuing plant science.
- How do we broaden representation in plants?
- Eurocentric view of plants in society are an obstacle. We should teach more broadly than simply with an Eurocentric view. This would include ideas like living with plants as essential rather than just as a tool for our use or building evolutionary histories (this could be phrased better....).
- Lack of representation leads to a lack of representation - break the representation cycle.
- Curricular sequencing, and ensuring that diverse student bodies are retained and persist through introductory STEM courses. Culturally-relevant messages to help attract students of color and underrepresented students in STEM careers.
- Conferences can be alienating to those not in the majority. They are expensive, exclusionary, and do not include slates of keynote/major speakers from diverse backgrounds.
- NAASC: volunteers for leadership roles have transitioned to being almost 100% women over the past 20 years. Therefore, DEI activities fall more and more (as well as all volunteer/community-representation) onto women. This has myriad ripple effects- on individuals as well as communities (including the role models/mentors seen by earlier career folks)
- NAASC: challenge in outreach to HBCUs and inclusion in our activities as many (most?) of them focus more on agriculture (not plant biology or molecular biology) or medicine. How to engage these communities and convey value of plant biology to their lives and careers?
- ASPB PUI section has worked to build a diverse steering committee to share the workload and represent the full diversity of PUI faculty. We have gender diversity and diversity of career stages, but lack racial/ethnic diversity.

- SACNAS does not have very many plant biologists, so it's difficult to build a plant bio community there.
- Minoritized faculty have to be careful about taking on too much representation to avoid burnout. But also for faculty of color not being asked represent on too many things.
- Corteva has goals for diversifying its staff, but its (Iowa) applicant pool is not very diverse, presenting challenges.
- Decline in membership moreso a generation issue; inclusion of MSI an afterthought; inclusion of perspectives and institutions not often considered; SACNAS facilitates recruitment to grad school; ASEB has better representation at their meetings
- BSA gathering demo and profession data; providing to support for the development of programs to address this issue; advisors are unfamiliar with other career paths making mentorship and career transitions more difficult
- How to make meeting inviting and inclusive; how to include younger populations like high school students and undergraduate students; at maize genetics meeting, set up 1:1 meeting with students and faculty
- HS students often do not know these plant studies related fields exist; a population of students we need to reach
- Power dynamic in academia can be a barrier for students;
- Large issue is retention of people through the pipeline, not just recruitment

**What are some ways that these challenges could be overcome? Propose small steps and bold approaches!**

- A way to highlight job postings within society networks (rather than Inside HigherEd only) (many ask for fees to post, making them inaccessible).
- There is a lot of mystery around jobs in academia (pay, etc) - are there ways societies could help make this more transparent, or push for transparency? Alternatively, a conversation within society members to share experiences/knowledge.
- Society job postings could require transparency (e.g., you must post a salary range in order for society to advertise)
- Training or other methods to encourage students to stay in STEM at undergrad level; ways to foster undergrads exploring STEM as a career path
- Support for mentors (to recruit undergrads into their labs? Esp at unis without internal funds for it); mentor training
- Programs to get more plant science in intro biology; provide resources for non-planty folks to incorporate plant biology into courses
- Network or email list to ask for someone to zoom into class (to increase plant focus, provide representation).
- A database of teaching tools/papers for students at the appropriate level (undergrad, K-12) - e.g., help the society members with curriculum development
- Expand Planting Science
- Some societies have funds to support short term financial barriers to academics.
- Teaching teachers the value of plants (as equal to animals). Include culturally relevant pedagogy for plants.

- A framework for taking up plant scientists in the system that are “out of the pipeline” that has been established due to a number of issues often related to financial situation and cultural background.
- Relationships
- Working within the community, not just the academic institution for plant science teaching to equalize the plant/animal approach in our communities, this can be especially important for underrepresented communities.
- To increase representation we could increase our recruitment and retention focus on community college, PUI, HBCUs, MSIs- and even K-12.
- How about scientific societies promoting employment at PUIs, HBCU, MSIs so that plant biology is represented at those institutions to encourage students there to move into plant related careers?
- [not necessarily bold] Survey of why people that drop out of the community? (there may be such surveys done at the level of the funding agencies, or US Gov’t, census or something?)
- Explore cohort-development w/minoritized folks at college, grad school, industry, etc. This approach could strengthen recruitment and retention over including individuals. This is a challenge, as it may already be quite difficult to recruit /retain even a small # of folks.
  - Perhaps an approach is to develop institutional cohorts - which could be across years, across disciplines, etc. Intentionally building community - mentors, peers, advisors, friends, so that people facing challenges have a support structure.
  - Or bolder (?) with more practice with zoom and virtual interactions due to Covid- can we develop cohorts that aren’t restricted to geographic location?
    - A past NAASC awardee developed a private Discord server- Adventitious roots- which is an invitation only private conversation tool for minoritized plant scientists to create safe space

**Propose one or more tasks that a ROOT&SHOOT working group could carry out to investigate and mitigate the challenges or pursue solutions you have identified.**

- See above, a mix of short term and longer term proposals.
- Provide training for our affiliates at K-12 and Junior Colleges in underrepresented communities to broaden how we teach students about plants. Perhaps a session at annual meetings.
- As above - engage with institutions that have higher percentages of Black/African American, Indigenous, and Latina/o/x students (HBCUs, Tribal Colleges, HSIs, Community Colleges) to talk about plant science and to recruit and retain students on plant science degree paths.
- [Lived experiences from an Indigenous perspective:] Higher education severs relationality/connection to community, language, land. In order to persist in higher ed as educators, scientists, or researchers, we are required to remove ourselves from communities of origin and to culture-switch/code-switch into a Eurocentric system of values and rewards. There is no cross-permeability of cultural boundaries, academia does not honor or celebrate culturally-responsive work done in community or in aid of self-determination. The opposite is also true: advanced education in plant sciences is not understood as benefitting First Nations, Inuit, or Metis communities (this is an

opportunity to better communication of plant science degree outcomes, and for developing culturally-responsive curricula). Plant science/botany has no answer for the student or ECR who says, “Okay, but how does this help me to get back to community/land; how does this promote sovereignty (of land, language, culture, education, health, justice)?”

## Work-Life balance

The current academic working environment often prioritizes productivity over well-being, with researchers working long days and on weekends. Institutions do not typically prioritize work–life balance, leading to the loss of valuable talent in the research pipeline. This may be especially true for trainees from underrepresented backgrounds, who face additional hurdles to their professional advancement in the current academic environment while attempting to maintain work–life balance.

[From Bartlett et al. (2021). Ten simple rules to improve academic work-life balance. PLoS Comp. Biol. 17(7), [e1009124](#).]

### **What are some of the equity challenges that pertain to work-life balance?**

- Unrealistic expectations from some groups due to bias (unmarried people who are expected to work long hours or during holidays)
- Absence of centering the experience of the individual and assuming that the top or leader’s experience is the norm
- Leaders who are not educated about “work life balance” or having supportive leadership
- Bias and denigration of those who are prioritizing work life balance as “lazy or unavailable”
- Immigrants/younger scientists being labeled as “hardworking” and not allowing for or understanding the importance of work life balance for all.
- Expectation that students (PhD) work all the time
- Expectation for continual work extends throughout careers
- Academia has a norm of 80+ hour weeks
- Science is international and so meetings are across variety of timezones
- First step is recognizing there is a problem.
- Possible policy/structural changes (required leave)
- Severe challenges meeting impact factor standards in plant sciences (compared to other disciplines)

### **What are some ways that these challenges could be overcome? Propose small steps and bold approaches!**

- When tasks leadership or times are allocated provide clear instruction about the boundaries of the commitment required and make safe spaces for everyone who want to prioritize work life balance

- Survey and figure out the composition of the working group or leadership and cater not only what we do but how we do things to be able to accommodate prioritizing work life balance
- Provide work life balance training for leadership as well as the composition members
- Educate the group about overcoming the bias labeling and the effects of negatively portraying work life balance
- Provide education to the immigrant or younger participants about work life balance
- We need to try to change things so that students advancing in their careers now do not face the same challenges.
- The idea of requiring people to use their leave time, take vacations.

**Propose one or more tasks that a ROOT&SHOOT working group could carry out to investigate and mitigate the challenges or pursue solutions you have identified.**

- Educate participants about work life balance through training programs at the conference
- Providing specific language in the societies to make it clear that the leadership and working structure value and encourage work life balance
- Work life balance training for leadership
- Gather survey information on work life balance of the society membership

## **Inclusive culture / discrimination**

Inclusion is the act of creating environments in which all members of a group are welcomed, respected, supported, and valued. Inclusive environments increase productivity, awareness, knowledge, and empathic understanding of the complex ways individuals interact within groups. Everyday experiences of bullying, harassment and discrimination can lead to culture of high diversity but low inclusion.

**What are some of the equity challenges that pertain to inclusive culture or discrimination?**

- Network of ‘old boys’ and misogyny is still around, this fundamental issue is something we need to address and acknowledge
- Issues with hiring women in the field and giving them tenure compared to accommodating faculty hires for male spouses
- DEI chairs are being taken off of hiring committees in certain universities and states
- Ongoing issues with sexual assault, it relates back to the ‘old boys’ club.

**What are some ways that these challenges could be overcome? Propose small steps and bold approaches!**

**Propose one or more tasks that a ROOT&SHOOT working group could carry out to investigate and mitigate the challenges or pursue solutions you have identified.**

- At what point are you going to seek a partnership with a big state university system that have the clout to make a difference

# Leadership / funding / awards

All organizations and institutions have mechanisms for recognizing and promoting individuals. These include positions of leadership or power, direct funding through travel and fee waivers or stipends, and awards programs. How are these benefits distributed - who makes the decisions, and who benefits? Should prestigious prizes be named (for individuals) or focus on accomplishments? What *should* organizations support through leadership, funding, and awards, that they are not already?

## What are some of the equity challenges that pertain to leadership, funding, and awards?

- How to be intentional in having diverse panels, and diverse presenters at meetings.
- But we're asking people to review for very little pay, and it doesn't advance careers
- And, women and people from BIPOC communities are asked all the time to join all panels because of the lack of diversity in the sciences.
- How to encourage grant applications from minority-serving institutions? They often have a heavy teaching loads.
- Leadership: Implicit biases in the way that society leadership/awards happen. Gatekeeping. Keeps people from participating.
- True leaders in many of our professional societies – the people really pushing for positive change – are students and ECR. But they are not “qualified” in terms of “time served” to take on actual formal leadership positions in the organization
- GRFP buzz in last two weeks shows that review comments are still biased/racist/ableist.
- Considering named awards - there is a balance between the society's desire to attract donors, the excitement of students honoring past luminaries in a field, and the potential for projecting exclusivity for minoritized individuals or bad PR for the society when there is an award named after a scientist with a problematic past..
- Funding - for folks teaching at HBCUs, the teaching load is huge, and there simply isn't time to write large grants, and it is difficult to execute grants in addition to this load, even just to get students to conferences.
- How to not tokenize people?
- Inequality from people's wealth leading to inequality in career options
- How to distribute work? Not make a “reading group”
- Desire for representation on committees, leadership, but often tap the same people (who are overcommitted). Perhaps we can enable them to have a lower workload on the committee to provide input and representation of opinions, but not expected to have to do lots of additional work. Be strategic about asking people to do less work to alleviate some of the imbalance.
- How can someone judge workload if description is out of date or incorrect? Accessibility/description of responsibilities to leadership needs to be clear.
- Travel to annual meetings
- **Issue 1: Not funding trainees directly leaves them vulnerable and unrecognized**
  - Trainees who are vulnerable in the power structure of academia are funded through the lab, not as individuals, which means they are tied to that position; irrespective of the culture and climate. The current system asks PIs to prioritize the project, often over the training/environment. The conflict between training and

productivity that PIs are faced with. Conflict also for the trainee who wants to build a wholistic training portfolio, but the funding is based on the research project. (Mobility/consistency is a related issue.)

- Fellowships etc need to cover more folks (e.g. international students). Apply an equity lens to ensure that more folk are competitive for any expanded research/training opportunities
  - Lack of Family/Compassionate leave funding for trainees
  - Trainees contribute to grant writing but are not credited.
- **Issue 2: Leadership is narrow, in terms of representation/diversity.** So there is a narrow set of experiences and perspectives present in positions of power. Our process of selecting leaders may lead to this canalization? As well as the support of development of early career scientists (another group discussing).

**What are some ways that these challenges could be overcome? Propose small steps and bold approaches!**

- Pay attention to composition of panels when they are conceived and constructed
- Offer substantive relief from 'other duties' to allow over-invited persons to join committees/panels
- Provide 'the data' for people to consider discussed the documentary <https://www.pictureascientist.com/>
- Investing in long term goals, engaging participants from diverse communities, giving importance to their experience and knowledge can be effective towards integrating diversity, equity and inclusion.
- Maybe consciously abandon the "one-size-fits-all" mindset and tailor services for individual community members' taking into consideration their unique conditions and cultural factors to bring them forward.
- Formal mentoring for junior members of professional societies – bringing people along (student and/or other ECR memberships on steering committees)
- Re: award names, be upfront and frank about conditions of new donations that named awards may be revoked by the Board in the future.
- **Funding individuals, rather than projects.** Gives postdocs and grad students agency to leave labs and go elsewhere if they need to and/or the environment dictates.
- Training grants vs research grants...training grants prioritize the Trainee vs the research project itself. Other countries have funding for students separate from the research project. Expanding who can be a PI on a grant could be important too (within university rules and funding agency rules) to attribute credit where it is (builds careers).
- Write up descriptions of each position and update the website so they are current, including incentive. What does it do for the person's career, not only what they can do for the society.
- Decreasing workloads
- Awards: Targeted request for award nominations to help recognize new/diverse individuals. Need a broad pool to be able to make awards to diverse individuals.
- More travel awards. Mentorship for new individuals to feel welcome into community



- Encourage and mentor students for NSF GRF + NSF PRFB proposal preparations. How do we make these more diverse?
- Special opportunities for travel awardees for career networking, future employers, program officers, cohort of peers → leads to future successes within group.

**Propose one or more tasks that a ROOT&SHOOT working group could carry out to investigate and mitigate the challenges or pursue solutions you have identified.**

**Idea 1:** *We need to lobby funding agencies to create more training grants (fund people not projects at trainee level) but being very intentional with the structure/equity of those programs! This could also include mentor training and selection as well. Also lobby for culture shift within institutions to value training grants as much as research grants*

## International & immigrant issues

Although science is international and the challenges we seek to address are global, funding, hiring, and immigration are constrained by national boundaries. Although this project is funded by the US National Science Foundation, the scientists served by the partnering organizations are international in place and origin. What inequities particularly affect international and immigrant scientists?

**What are some of the equity challenges that pertain to International scientists and immigrant issues?**

- Worried about cultural appropriation to impose a US viewpoint on the rest of the world.
- Having a constant worry about visas, get locked out of the country at some point. Some PIs also use this to bully students.
- Not many funding opportunities are available to international scientists.
- Language issues - universities, societies that welcome international students to provide language speaking and writing.
- Access to meetings, virtual meetings to be continued for international participants. Beneficial to interact with other scientists in countries with higher flora/plant/vegetative diversity.
- Access to federal jobs.
- International scientists are not eligible for remuneration/are not paid for reviewing USDA/NSF grants if they do not have a green card.
- Most international scientists who study abroad upon returning to their under-resourced home countries are unable to utilize their acquired skills due to lack of equipment and funds.
- Some internships open to international students do not have pathways to leadership positions.
- Difficult timing for international meetings.
- Considering whether software is available internationally
- Visa-related challenges due to national policy changes, world crises, immigration backlog etc.

- Funding opportunities for non-citizens severely limited, thus limits their career advancement, and may be compounded by visa-related issues
- Available internship/funding opportunities not known to new immigrant students/postdocs or immigrant faculty. Mostly learning on the job.

**What are some ways that these challenges could be overcome? Propose small steps and bold approaches!**

- Recruit volunteers to improve written/submitted manuscripts and assist authors. Maybe also more acceptance of language that is understandable although maybe "non-standard" in journals - rather than the typical gatekeeping?
- Setup a center for language skills. Online training or tutoring.
- Networking within international students. In big universities there are options but within small college towns there are fewer such opportunities.
- Have some lawyers whom we could contact if we were having problems and they would be able to advise us regarding our specific problem.
- Having workshops for faculty for PI with international scientists so they will be more aware of the challenges students face.
- Invite United Nations members to speak to society members. International botanical associations are more accustomed to US based organizations.
- Contacts at State departments - whether scientists were working for the country or their country of origin?
- Setting up workshops at meetings
- I suggest accessibility to well funded labs will be of great help either through collaborations or by establishment of labs in developing countries with skilled scientists who can make good use of such labs.
- Representation in leadership in the society leadership structure
- Monitoring beyond the society conference participation time for mentoring
- Offering sessions at different times of day (to provide access to different regions in the world), so content and discussion can be available for more people

**Propose one or more tasks that a ROOT&SHOOT working group could carry out to investigate and mitigate the challenges or pursue solutions you have identified.**

- Can RCN help us develop an online platform for international students to network.
- Develop a contact point for immigration issues.
- Some funds should be allocated to equipping labs for skilled scientists in developing countries, there are so many areas to explore in such areas regarding food security, however due to lack of resources most ideas remain ideas and do not become beneficial
- Organize a career counseling session for immigrant students at conferences, and potentially expand so mentoring continues through some stages of the immigrant career
- Make more funding and internship opportunities available for international students
- Provide information and training for both domestic mentors to understand immigration issues and challenges students/scholars might have; and training for mentors to learn more about internship/funding/fellowship opportunities available regardless of citizenship

- Incorporate international leadership positions within societies
- Create spaces (sections/interest groups) within societies for immigrant scientist issues

## Issues affecting LGBTQ+ population

LGBTQ+ students and professionals in STEM encounter discrimination and challenges not faced by their heterosexual, cisgender, and gender-conforming peers. LGBTQ+ people in STEM are more likely to face career limitations, harassment, and professional devaluation, and are more likely to leave STEM than their non-LGBTQ+ counterparts.

(From [S. Field and A. Rajewski \(2021\) Plant Cell 33: 1859–1862](#))

(No notes taken for this topic)

## Culturally responsive mentorship

Mentorship is a catalyst capable of unleashing one's potential for discovery, curiosity, and participation in science. Mentees without access to culturally responsive mentoring can experience identity interference or identity conflict and concealment, which is the perceived or actual discordance between different aspects of an individual's identity. This can lead to self-doubt, reduced psychological well-being, and lower academic or professional performance. There is a gap between what we know about effective mentoring and how it is practiced in higher education.

(From [The Science of Effective Mentorship in STEM, National Academies Press](#))

### What are some of the equity challenges that pertain to mentorship?

- Mentors at all career stages who are not members of underrepresented groups are often ignorant of the challenges that their mentees from those groups face.
- They also often lack the training needed to overcome their ignorance, and as such they default to mentoring in the way that they were mentored (e.g., assuming cultural norms, fixed expectations, etc.).
- The lack of training may be due to poor availability of mentor training opportunities at their home institution or, more generally, they may simply be unaware of the broadly-available resources that they can access (e.g., those provided by CIMER both in-person and virtually).
- In addition, more senior scientists that are highly productive and established in their careers may not see the value of changing their approach that has already served them well enough for decades.
- Lack of knowledge among international students/ researchers about the available resources
- Lack of knowledge about research opportunities exist among undergraduate students
- Communicating with students better about resources
- Mentoring to address personal differences ( i.e. being shy about asking questions etc?)
- Unlearning some existing barriers in front of inclusivity

- Empowering students/postdocs to ask for help/mentoring

**What are some ways that these challenges could be overcome? Propose small steps and bold approaches!**

- Easily accessible mentor training opportunities need to be developed and broadly advertised to plant scientists of all career stages.
- In particular, senior scientists especially need to be targeted because their mentoring efforts are especially influential within the community since they often have the most funding and therefore mentor the highest number of junior scientists.
- To appeal to senior scientists that are “established in their ways” and hesitant to incorporate alternative mentoring approaches, notable scientists in the field need to be recruited to complete and implement culturally aware mentor training and then be given the opportunity to broadly share their experience with colleagues.
- By providing mentor training opportunities to scientist at all career stages and then amplifying their voice in sharing their experience, this will revolutionize the status quo of what are considered acceptable mentoring practices in the plant science community at large.
- Involvement of undergraduate student to research: developing peer relationships in the classrooms ( i.e. build relationships between graduate students/researchers and undergrads)

**Propose one or more tasks that a ROOT&SHOOT working group could carry out to investigate and mitigate the challenges or pursue solutions you have identified.**

- In summary, in addition to broadening access to mentor training generally to scientists at all career stages, convincing senior scientists to access and complete mentor training and then implement and share what they learned is crucial for bringing about rapid change within the community.
- Transparency, leveling the playing field
- Educate mentors about being intentional
- Increasing the number of research opportunities for undergraduate students.
- CUREs for undergraduates at places with few research opportunities

## **Inclusive conferences**

Scientific meetings can be invigorating, promote the exchange of ideas, foster new collaborations, and provide opportunities to reconnect with existing colleagues. They form an essential part of the connective tissue for the global scientific enterprise. However, not all scientists have positive experiences when they attend scientific meetings. Some members of our scientific communities are left out (intentionally or otherwise); others feel isolated in meetings when they do not see others who look like them or share a common background; some encounter barriers, such as lack of childcare or safe bathroom spaces, that keep them from fully participating; and some are targets of harassment and assault at meetings.

(From [Guide to Organizing Inclusive Scientific Meetings](#), 500 Women Scientists)

## What are some of the equity challenges that pertain to conferences and meetings?

### Resource barriers

- Financial
- Time (to go, to apply for funding, etc.)

### Inclusion of all personality/communication/collaboration styles

- Conferences tend to cater to the extroverts
- Many of the social opportunities are centered around drinking
- Lack of representation of marginalized identities - conference attendees with marginalized identities may feel uncomfortable. Both in attendees and in presenters

### Location of conferences:

- Financial implications
- Discriminatory laws in some states

### Access issues

- Registration forms not asking about disability/accommodation broadly
- Basic accessibility issues not met: no priority seating, tables/chairs not set up for wheelchair access, no CART or interpretive services, etc.

### Logistics problems

- Money- not everyone can travel
- Geography of conferences make them inaccessible esp for people from lower GDP countries
- Difficult to parent and participate, not family friendly
- Physical spaces that do not accommodate physical differences
- Some formats/forums may not be comfortable ways for people to participate
- Being aware of scheduling – weekends can be problems for various reasons (work-life balance, religious practices, etc) – Also being aware of dates that overlap with religious holidays or important days that may limit representation of some groups.

### Issues related to presenters

- Speaker pools that derive from the same pool of \*stars\*/top heavy line ups
- Undergrads, Grad students, early career scientists not well represented
- POC not well represented- the speakers do not reflect the community
- Hidden minorities- minoritized populations that are ‘grouped’ within a larger population
- Bias towards R1 institutions- less representation from PUIs, HBCUs, MSIs, Tribal Colleges, etc... they don't receive the same funding
  
- Child care should be available for parents to attend
- Limited attendance of individuals from economically challenged situations
- There could be greater diversity of the speakers and different people invited to present not just the same well known researchers
- Increasing diversity among speakers
- How to discuss representation at a meeting as meeting is being organized
- How to have a constructive conversation about issues that arise in conference organization with society membership
- How to respond to concerns from membership at the society level, especially via social media

- International conferences pose different challenges to organizing a conference with differing perspectives and values concerning DEI
- Differences and values among members reflecting, age, gender, and many others represent many perspectives to consider in conference organization
- More negative than positive feedback is received by conference organizers
- Some conferences represent many participating societies that are involved in many major decisions - selecting symposia and colloquia, as well as keynotes.
- Reaching beyond your community to journalists, educators, etc - the norms are quite different, how to include folks from these areas

**What are some ways that these challenges could be overcome? Propose small steps and bold approaches!**

- More money to fund participation from minoritized individuals (domestic and international) from professional societies, private and government funders
- More support and training for organizers to teach them how to select speakers with intention to equity, diversity and inclusion
- Support for parents or people traveling with people needing care – ‘daycare’, mothers rooms, group activities during conference
- Paid childcare at conferences
- Include more early career and students in conference programme - invited speakers
- Pay attention to physical spaces and give people opportunities to be able to present in non standard ways (standing at a poster for example might be hard for some people with physical challenges, as would be socializing around bar height tables)
- Hybrid options for those unable to travel - ensure that these are interactive
- Train/support PIs in learning to step back and let their trainees speak (make travel funds available in research grants specifically for trainees to attend conferences)
- Waive membership/registration fees for more participants
- Offer onsite child care or stipend (to support of a family member/nanny to travel)
- More travel grants to increase attendance of individuals from economically challenged situation
- Sliding scale of participation costs
- Community organized sessions that increase diversity of speakers
- Stimulate connections between experienced and new investigators
- Codes of conduct, e.g. NAASC for ICAR:  
<http://arabidopsisresearch.org/index.php/en/naasc#ICARCode>
- Some conferences represent many participating societies that are involved in many major decisions - selecting symposia and colloquia, as well as keynotes. With proposals submission, make clear that organizers should consider diversity among symposium participants from different perspectives and diverse topic areas. Effort to provide feedback for those who submit proposals.
- Recruiting ideas for speakers from all society members
- Adding virtual elements to conferences (such as what is happening for Botany 2022), so that the conference is more accessible (broadens who can participate, either due to geography, finances, physical or other ability, etc.)

**Propose one or more tasks that a ROOT&SHOOT working group could carry out to investigate and mitigate the challenges or pursue solutions you have identified.**

- Find out how society conferences that do offer child care manage and organize it
- Consider alternative ideas to on-site child care such as “stipends” that can be used by parents towards offsetting their own child care costs (Maize Genetics Meeting currently offers this approach, ICAR in North America has offered this, ICAR-Belfast is offering this for 2022)
- Develop a holistic rubric to enable conference organizers to select speakers from submitted abstracts to promote a diverse speaker line-up
- Create human and communication resources that organizers can tap into for successful models, advice, troubleshooting.

## Accessibility and ableism

Scientific research, education, and even zoom meetings are rarely designed to accommodate people with medical conditions or disabilities. Science is often criticized as having an ableist culture: ableism is discrimination or prejudice against people with disabilities, or discrimination in favor of the able-bodied. True access goes beyond legal requirements; it involves thoughtful dedication to creating a culture of inclusion and understanding of all disabilities that allows everyone to perform at the highest level.

(From [Science Diversified: Tackling an “Ableist” Culture in Research](#) and [Our Disabilities Have Made Us Better Scientists](#))

**What are some of the equity challenges that pertain to accessibility and ableism?**

### Conferences

- Speakers/presenters: few/no options for deaf/hearing-impaired
- Poster session: few/no options for blind/visually impaired

### Lab and Research Spaces

- Simply not designed for differently abled researchers/scientists
- There seems to be very little representation in the plant sciences of differently-abled individuals [*Editor’s Note – we have retained this phrase as it was written, but note that the term differently-abled is not recommended*].
- Hearing impairment at conferences— challenging to hear voices in noisy backgrounds
- Normalize disability
- Thinking about different settings: conferences, teaching, etc.
- Specific challenges but also safety of COVID protocol:
  - Lip reading for Deaf or hearing impaired folks have challenges with mask wearing
  - Folks with compromised immune system etc. benefiting from mask wearing
- Accessibility of online portals for journal websites, forms used in awards, travel funding— not accessible for screen readers

- Physical vs. cognitive disabilities- can plant sciences be a career path for children with cognitive disabilities
- Think broadly about accessibility... e.g., include thinking about the trans community with regard to restroom access (or is this mission creep for a committee focused on ableism?)
- Thinking about how our societies and conferences are being accessible (or not) but also how do we encourage our members to do so as well
- Being mindful of visible and invisible disabilities
  - And also that not everyone wants to disclose their disability
    - i.e. we shouldn't ONLY provide accommodations when they are asked for by a person sharing they have a disability - think about aiming for having standard accessible accommodations that are always implemented and then more extensive accommodations may need to be requested
- Not something discussed in the breakout, but something to chew on: the way plant sciences often pursues outreach is through outdoor activities, many of which are inaccessible to folks with many types of physical disabilities. What types of outreach can target those members of the broader public who can't go on hikes?
  - Ah yes! I agree, this make me think of a great follow on Instagram called @disabledhikers not really focused on plant sciences, just hiking
- Also, not discussed in the breakout room: the very fast paced nature and extrovert-centric culture of conferences can be hard for Autistic people, people with sensory processing disorders, people with disabilities and diseases that requires them to have frequent breaks or frequent use of facilities, and others.
- From the chat section of main Zoom room: mental health needs to be considered (in the "hidden" category)
- Mental health - safe and quiet spaces at conferences
- Accessibility - includes economic barriers, sense of belonging to the organization that you belong to. Have to think about categories that are concealable (anxiety, depression) and some which are not. The idea of the group of people we serve is still very narrow.
- Challenge most faced during conferences but we cannot only focus on that.
- NSF can provide a supplement if students hired on NSF projects are disabled.
- Multimode accessibility - captions can be useful for some people but the opposite for some others.
- At the grassroot level - how can we increase participation, influence recruitment and hiring

**What are some ways that these challenges could be overcome? Propose small steps and bold approaches!**

- Begin outreach to younger groups to ensure that plant science is a career option for all people, including those with disabilities
- Advertise opportunities for help from NSF, NIH, etc for disabled scientists
- Plan conferences with accessibility in mind (most planning seems to be around physical accessibility)
- Alt text for ads, etc. in social media platforms and websites (@AltTxtReminder on Twitter)



- This could even be a webinar training that we offer to our various members etc.
- Make sure conferences are wheelchair accessible
- Priority seating for visual and hearing impaired folks
- Lots of cheap solutions exist that we can take advantage of as societies, and as individuals
- Gender neutral bathrooms— all you need to do is switch a sign!
- Choose venues that are accessible (if not accessible, can rented ramps be brought in? Can signs be put on restrooms?)
- Often people don't come forward and disclose their disability because of the stigma attached. Therefore having people whose main job is to specifically ask this question and ensure inclusivity.
- Disseminate information about Increasing accessibility as a career.
- How do things like annual meeting comments work or running for leadership positions - increase representation on leadership teams.

**Propose one or more tasks that a ROOT&SHOOT working group could carry out to investigate and mitigate the challenges or pursue solutions you have identified.**

- Universal set of best practices for conferences and content
- Develop a checklist for choosing accessible venues for conferences and board meetings (or list of best practices— short and long term recommendations)
- Working group to target the *very broad* membership of the differently abled community
- We could start with ROOT and SHOOT (Priming the pump funding) and then the society finds their own funding. Setups a situation to continue the work within the societies.

## **Publishing and authorship**

Publications are the primary metric by which most academics are judged, but we also know that there are biases and inequities inherent in the publishing system. Appointments to editorial boards, selection of reviewers, and the evaluations of reviewers are all subject to bias, as are decisions about authorship and author order.

**What are some of the equity challenges that pertain to publishing and authorship?**

- Representation on boards
- Where the needs might be amongst Botanical Journals:
- Diversity of journals and practices (for profit vs non-profit), etc;
- Publication costs, how to maintain a healthy publication ecosystem; Tiered system? Still a burden;
- Selection of reviewers, how to find a more diverse group of reviewers;
- Accessibility aspects of publication (ableness as well as affordability);
- Some kinds of contributions end up being minimized beyond their scientific relevance;
- Whose contributions get recognized - experts/leaders in the field is based on citations, not necessarily the people leading the work;
- Publication silos; data sharing – publication;

- The idea that there is one single path to success, what are the different models for success;
- Who gets to be an author: local researchers don't get to be authors in international collaborations.
- People who don't have funds for open access (most people who are in South America / Africa can't afford OA fees). This is silencing important voices.
- Selection of editorial boards - mostly by "who knows who".
- Editorial board service is uncompensated - does this make it infeasible for ECRs?
- Reviewer bias. Doubly-anonymous peer review? Talk about it a lot, around and around. Or, open peer review - peer reviewer names shown.
- Potential for repercussions for reviewers if their names are provided (even for accepted papers).
- **Power differential (this is at the core of so many different issues!)**
- Author order - all the rewards go to the first author. Can we reward everyone meaningfully who works on a project? Why are women more often the middle authors?
- Accessibility of paper submission systems - some are not compatible with screen readers for visually impaired
- Academics not the only ones publishing - industry scientists are also publishing. This definition is narrow. Negative perception of industry scientists by people in academia and in the scientists - very big barrier to participation. This academic bias is a barrier to equity. Bias against industry science - held to a different level. Also can't share certain things. Sharing of resources is difficult. There are scientists in industry that want to publish, and want to be involved as reviewers. Hard to maintain connections once you move to industry.
- Editorial board and reviewer selection subject to bias
- Including authors from minoritized demographics as authors

**What are some ways that these challenges could be overcome? Propose small steps and bold approaches!**

- bioRxiv?
- Applications - anyone can apply to be part of an editorial board.
- (BSA) Early-career advisory board - anyone can apply to be part of it. Very successful (10 people, eight different countries). They can advise the editorial board and provide essential feedback - what is important to them.
- Access to industry contact details to reach reviewers (reviewer databases)- more . Include industry scientists on editorial boards, as reviewers.
- Reviewer training programs - some sort of badge that lets editors know that you will be a good reviewer
- Editorial board open nominations/applications

**Propose one or more tasks that a ROOT&SHOOT working group could carry out to investigate and mitigate the challenges or pursue solutions you have identified.**

What is the demographic representation of people in industry vs. academia in our professional societies? Who is this impacting? (But this is hard to get)

## Gender bias

While most scientists believe that they are fair and unbiased, numerous well-designed studies show that gender bias in sciences is widespread and persistent today. Recent studies show that gender bias affects student grading, professional hiring, mentoring, tenure, promotion, respect, grant proposal success, and pay. In addition, sexual harassment remains a significant barrier.

[From [Roper \(2019\) Does gender bias still affect women in science? Microbiol. Mol. Biol. Rev. 83: e00018-19](#)]

### **What are some of the equity challenges that pertain to gender bias?**

- Unconscious bias - in both men and women - needs to be discussed openly and often
- Higher positions are occupied mostly by men.
- And men are often perceived as inherently better leaders by virtue of seeming more “authoritative”, “stern” etc., whereas women are typically perceived as more “soft” and less decisive etc. None of these things are of course uniformly true, but the perceptions exist.

### **What are some ways that these challenges could be overcome? Propose small steps and bold approaches!**

- Changing culture/climate at the Dept. level - starts with leaders/senior faculty
- Holistic graduate admissions processes which relies on narrative vs. GRE scores/grades (exclusive metrics for the privileged) Resources from NSF-ADVANCE Institutional Transformation Grants; search on web: strategic toolkits for gender equity.

### **Propose one or more tasks that a ROOT&SHOOT working group could carry out to investigate and mitigate the challenges or pursue solutions you have identified.**

- Study NSF-ADVANCE IT initiatives at major universities - these awards target fixing the institution, vs. the woman - to increase the # of women in STEM tenure-track positions - creating transparent processes floats all boats.

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