

Scientific societies fostering inclusivity through speaker diversity in annual meeting programming: a call to action

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ABSTRACT Scientific societies aiming to foster inclusion of scientists from underrepresented (UR) backgrounds among their membership often delegate primary responsibility for this goal to a diversity-focused committee. The National Science Foundation has funded the creation of the Alliance to Catalyze Change for Equity in STEM Success (ACCESS), a meta-organization bringing together representatives from several such STEM society committees to serve as a hub for a growing community of practice. Our goal is to coordinate efforts to advance inclusive practices by sharing experiences and making synergistic discoveries about what works. ACCESS has analyzed the approaches by which member societies have sought to ensure inclusivity through selection of annual meeting speakers. Here we discuss how inclusive speaker selection fosters better scientific environments for all and identify challenges and promising practices for societies striving to maximize inclusivity of speakers in their scientific programming.

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Abbreviations used: ACCESS, Alliance to Catalyze Change for Equity in STEM Success; AMSC, Annual Meeting Steering Committee; ASB, Association of Southeastern Biologists; ASBMB, American Society for Biochemistry and Molecular Biology; ASCB, American Society for Cell Biology; ASPET, American Society for Pharmacology and Experimental Therapeutics; BOD, Board of Directors; BPS, Biophysical Society; EPD, Education and Professional Development Committee; ES, Endocrine

Society; MAC, Minorities Affairs Committee; SDB, Society of Developmental Biology; STEM, Science, Technology, Engineering, and Math; UR, underrepresented.

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INTRODUCTION

As scientific societies work diligently to advance the diversity of their membership, many have established standing committees dedicated to ensuring progress toward their inclusivity goals. A network of such committees, including those from the American Society for Biochemistry and Molecular Biology (ASBMB), the American Society for Cell Biology (ASCB), the American Society for Pharmacology and Experimental Therapeutics (ASPET), the Biophysical Society (BPS), and The Endocrine Society (TES), as well as the Scientific Careers Research and Development Group at Northwestern University (<https://www.careersresearch.northwestern.edu/>), have joined forces to establish a meta-organization known as ACCESS (Alliance to Catalyze Change for Equity in STEM Success). ACCESS member societies work to fulfill their common mission by coordinating their efforts to identify effective practices and challenges. One shared practice has been the goal of designing annual meeting programming to showcase speakers across a broad range of demographics.

Scientific societies use their annual meetings as platforms to highlight research from upcoming and established scientists and for these scientists to receive feedback on their research, network with fellow scientists, and engage in beneficial career development programming. These meetings also provide opportunities for society members to gather and strengthen their sense of community, while learning from colleagues about the latest developments in their fields of scientific research. In this context, invited speakers contribute substantially to both the scientific value of the meeting and the attendees' perceptions of themselves as a community of scientists striving toward shared goals and standards of excellence.

Strategic planning is imperative to maximizing the potential of annual meetings to foster diverse and inclusive societies. Efforts have been made to showcase the work of speakers from all backgrounds, especially those underrepresented (UR) in the STEM workforce. Intentional selection of a diverse range of speakers ensures that UR members are acknowledged and included. In fact, scientists from UR backgrounds can particularly benefit from attending scientific meetings where they see themselves represented among the speakers selected, as this helps to foster a confident identity as scientists (Kim-Prieto *et al.*, 2013; Hagan *et al.*, 2020). Conversely, the failure to achieve diversity and inclusivity among meeting speakers can contribute to the exclusion of members from UR demographics in STEM (Else *et al.*, 2019; Ford *et al.*, 2019), resulting in damage to the diversity of our STEM workforce ecosystem.

The present study is a collaboration between ACCESS and the Association of Southeastern Biologists (ASB) and the Society for Developmental Biology (SDB) to investigate ways in which each organization selects speakers to generate an annual meeting program that is representative of all demographics. Through this shared effort, we have identified challenges and recommendations for societies to keep in mind as they strive to foster diversity in their scientific fields. We discuss our findings in this *Perspective* as a means of sharing them with the larger STEM community and inviting further exchange of ideas and practices.

GUIDING PRINCIPLES THAT FACILITATE INCLUSION

Achieving diverse, equitable, and inclusive scientific societies requires sustained effort and determination from *all* members, not just their diversity-focused committees and/or UR members. In attempting to expand the work of these committees, we propose three guiding principles that facilitate inclusive practices in speaker selec-

tion. We briefly discuss these principles below, as well as relevant literature that provide supporting evidence.

Science quality and diversity are not mutually exclusive

A frequently articulated concern when societies seek out speakers from UR backgrounds is that inclusivity may be accompanied by a decrease in the quality of the scientific ideas and highlighted work, as well as in the discussions that ensue. An accumulating body of evidence indicates that this is not the case, and that the most effective and innovative science is performed by teams composed of individuals from different backgrounds, including diversity of gender, race, ethnicity, and career stage (Swartz *et al.*, 2019; Vallence *et al.*, 2019). In fact, a positive relationship exists between the diversity of the research team and the number of citations for their scientific publications, indicating that diverse research collaborations are more impactful (Freeman and Huang, 2014). Moreover, some evidence indicates that UR groups in STEM innovate at higher rates than majority groups (Hofstra *et al.*, 2020). These findings argue that our efforts to be inclusive of as many UR backgrounds as possible when selecting speakers to present their work can add value and propel scientific progress in the field by highlighting a more diverse pool of ideas and approaches to solving research questions.

Avoid statistical excuses for noninclusive practices

It is often assumed that the small sample size of selected speakers for an annual conference is a valid statistical excuse for the absence of speakers from UR backgrounds, who are limited in number within the field by definition. On the other hand, statisticians point out that while “zero diversity” is a possible outcome in small number statistics, it is not the most likely outcome (Nordstrom *et al.*, 2018; <https://kerstinnordstrom.com/fellows/>). When selection is unbiased, both under- and overrepresentation of UR demographics relative to their presence in the field should be observed in the outcomes of small group selection and small number statistics. In reality, our repeated observations of groups characterized by a lack of diversity indicate the degree to which these small selection processes are often subject to biases. Thus, small number statistics do not provide a strong rationale to reduce organizational accountability for speaker diversity.

Recognize that epistemic exclusion exists in science

Human society is increasingly aware of social forces that differentially affect the lives and careers of individuals depending on the demographic categories into which they fit. Some of these social forces work against the scholarship of UR scientists being valued and taken into account, so that proactive efforts are required to anticipate and counteract their ability to relegate the contributions of UR scientists to the margins. Institutional norms of assessment and individual biases continuously reinforce environments that devalue the scholarship and legitimacy of faculty and scholars of color, a concept known as epistemic exclusion (Settles *et al.*, 2020). In a recent study, epistemic exclusion was reported to have been experienced in the workplace by 55% of UR participants (Settles *et al.*, 2019). These experiences can include scholarly work being overlooked or perceived as less legitimate and not belonging within the larger field. Despite the aforementioned report that UR scientists are more likely to introduce innovation into their fields of study, the same study found that their work is among the most often discounted (Hofstra *et al.*, 2020). One of the first steps in creating a more equitable and welcoming environment in which UR scientists can thrive is acknowledging that epistemic exclusion is a challenge we face.

SPEAKER DIVERSITY IN ANNUAL MEETING PROGRAMMING: CURRENT STRATEGIES

Table 1 summarizes the current approaches that ACCESS society members employ for speaker selection. Below, we highlight common strategies that ACCESS societies use to facilitate inclusive selection of speakers for their annual meetings.

Strategy 1: budget enough time for inclusivity in speaker selection

ACCESS member societies allot ~12–14 mo for annual meeting program setting (Table 1). Budgeting this amount of time means that scientific programs can be constructed and revised as needed to maximize representation of UR scientists. It has yet to be directly tested whether increased planning timelines facilitate building inclusive annual meeting programming, but collective anecdotal experience suggests that this is a contributing factor.

Strategy 2: collecting membership demographic information

At a minimum, societies planning for their annual meetings might aim to select a range of speakers that is representative of their current membership demographics. However, this initial “target goal” for speaker diversity can be difficult to establish given that demographic information is not always disclosed by members when they join the society (Segarra *et al.*, 2020). Accurate information about the demographic makeup of society membership can provide an idea of how likely societies are to underrepresent, represent, or overrepresent the group of interest (Nordstrom *et al.*, 2018). There are tools such as the *Conference Diversity Distribution Calculator* that can help with the establishment of target goals (<http://aanandprasad.com/diversity-calculator/?groupName=women&numSpeakers=20&populationPercentage=10>). In addition, disclosure of demographic information can be a way in which individual members can contribute to the ability of our scientific societies to obtain accurate data for diversity and inclusion goal-setting.

To aid in the efforts of collecting accurate demographic information about members, societies are now moving toward a model in which annual meeting abstract submission will ask presenting authors to disclose demographic information (ethnicity, race, gender identity), including whether they belong to institutions predominantly serving trainees from backgrounds underrepresented in STEM (primarily undergraduate institution, PUI; minority serving institution; historically black college and university, HBCU; Hispanic-serving institution, HSI; tribal college). The ASCB has implemented this strategy in 2020 and will use these data to guide future practices in speaker selection. Finding methods to effectively collect demographic information from presenting authors year to year will facilitate inclusion in speaker selection during annual meeting planning. This information provides a strong starting point by enabling speaker selection committees to take into account diversity and inclusion before inviting a range of speakers that is at least representative of their current membership demographics.

Strategy 3: diverse and inclusive membership in speaker-selection committees

Another strategy to increase diversity and inclusivity in annual meeting speaker selection is to hold open calls for applications for the society positions responsible for these selections. For example, ASCB has implemented an open call for applications for minisymposium coauthors. ASCB has just started to collect demographic information on these applicants. This application process is open to all members, giving all members access to these positions. One benefit

to this strategy is the potential for increased diversity of the speaker selection committee itself, expanding the collective network of those directly contributing to speaker selection. ACCESS will study in the near future whether these open calls for applications facilitate varied representation of speakers selected from year to year.

Studies have found that having diverse membership on a selection committee can lead to increased diversity in speaker selection (Casadevall and Handelsman, 2014; Ghatan *et al.*, 2019). Ghatan *et al.* found that having just one female coordinator on the Society of Interventional Radiology's Annual Meeting Committee led to almost a 30% increase in female speakers over a 3-year period (Ghatan *et al.*, 2019). A similar 2014 study found that having at least one woman on the American Society of Microbiology's convening team increased the proportion of female speakers by 72% compared with an all-male convening team (Casadevall and Handelsman, 2014). We believe that similar models can be adopted by societies to facilitate an increase in speakers from all UR backgrounds in STEM.

Strategy 4: make use of speaker referral lists

A growing collection of resources and tools have simplified the process of selecting scientist speakers from a diversity of backgrounds. Currently, there are databases that list qualified UR scientists from a wide range of fields and backgrounds (Table 2). In fact, many times these resources are generated by societies themselves in efforts to be strategic about diversity and inclusion. Resources such as the gender-focused list generated by Vallence *et al.* in 2019 take into account scientific impact and publications to ensure that the list consists of scientists who are active and highly productive in the field (Vallence *et al.*, 2019). Additional lists and databases have been previously highlighted (Bhalla, 2019). It is important to point out that individuals must consent to be included in these lists or databases, and have a right to choose how they self-identify.

SPEAKER DIVERSITY IN ANNUAL MEETING PROGRAMMING: CHALLENGES AND RECOMMENDATIONS

Challenges

Integration of diversity-focused committee work into annual meeting planning. Societies have historically relied on diversity-focused committees to articulate their inclusion mission and advance its progress. As societies strive to strengthen their diversity, equity, and inclusion efforts by engaging all members, committees, and leadership, it is important to find ways to connect and establish communication between a society's diversity-focused committee and additional stakeholders responsible for scientific program setting. Integrating or embedding diversity-focused committee members into the committees responsible for annual meeting speaker selection and inviting a representative from this committee to participate when draft programs are discussed among society leadership are strategies that can be used to accomplish speaker representation. These practices affirm the work of our diversity-focused committees and helps recognize the wealth of knowledge they have to share.

Scientific programming in the time of COVID-19. The COVID-19 pandemic has affected scientists around the world, not only through the closure of research institutions, schools, and daycares, but also by shifting most scientific society annual meetings to remote or virtual formats, limiting the networking and career development potential of these events (Porpiglia *et al.*, 2020). Women in particular disproportionately bear the weight of these new changes through increased childcare and other responsibilities

Society (no. members)	Planning timeline length	Speaker Roles Available	Selection Committee	Diversity-building Strategies Used in Speaker Selection	Final Approval of program	Assessment of Speaker Diversity
ASBMB (14,007)	1 year	Symposia, Prof. Devpt.	Program Cochairs, Program Committee	The "proposed" speakers are first vetted during a program committee meeting where other people on the committee (which includes a MAC and EPD committee member) make recommendations to try to achieve the best science by a diverse group of speakers.	Council	Postmeeting survey (geographical, institutional, gender, race/ethnicity)
ASCB (7308)	16–18 mo	Symposia, Minisymposia, Prof. Devpt.	Program Cochairs, Minisymposia Cochairs, Program Committee	Speaker Referral Lists (Table 2), Speakers limited to 1 talk/2-year period limit	Council	Demographic information collected for presenting authors during abstract submission (institutional, gender, race/ethnicity)
ASPET (4700)	13–14 mo	Plenary/Keynote, Symposia, Division, Prof. Devpt.	Program Committee, Division Leadership	Members submitting session proposals disclose demographic information for proposed speakers (including gender, type of institution, career level)	Program Committee	Demographic information is collected for proposed speakers
BPS (7500)	1 year	Symposia, Platform, Prof. Devpt.	Program Cochairs, Program Committee, Subgroup chairs	Council reviews speaker representation before issuing speaker invitations.	Council	Demographic assessment during planning process
ES (18,000+)	11 mo	Plenary, Symposia, Meet-the-Prof., Prof. Devpt.	Annual Meeting Steering Committee (AMSC)	The AMSC works to build a scientific program of diverse speakers. Specific speaker recommendations from the Committee on Diversity and Inclusion are considered.	Annual Meeting Steering Committee	Demographic assessment performed during planning meeting
ASB (690)	8–14 mo 6 mo 6 mo	Plenary Symposia Prof. Devpt. Workshops	Executive Committee Executive and Program Committees	Executive Committee takes into account speaker demographics when selecting Plenary speaker in order to increase representation from diverse groups.	Executive Committee	No formal process
SDB (2000+)	Planning begins by SDB President immediately after his/her election	Keynote, Session, Workshops, Theme Tables	President and Board of Directors (BOD), and organizing committee (made up of research faculty at the site/city holding meeting)	Once the research topics(s) are approved by the President and BOD, all contribute potential names so as to include a wide range in academic rank, sex, region, ethnic background, type of university (Research Intensive, PUI, etc.), etc., and showcase high diversity of speakers.	President and BOD	President, BOD, SDB community via postmeeting survey

TABLE 1: Annual meeting speaker selection strategies and approaches for ACCESS member and collaborator societies.

Creator/Curator	List(s) Description(s)	Weblink
ASBMB	Two chairs are selected for each annual meeting—one male and one female. They are tasked with selecting organizers for invited sessions based on specific topics. Those organizers pick the speakers for the sessions.	Internal, not available for public use
ASCB	Two lists available: – Minorities Affairs Committee’s list that includes scientists from URM backgrounds – Women in Cell Biology’s list including women scientists	https://www.ascb.org/career-development/speaker-referral-lists/
BPS	Find a Biophysicist Network—members volunteer to be contacted as speakers, classroom visitors, mentors, science fair judges, etc. While this list does not currently include demographic info, it will in the near future.	https://www.biophysics.org/find-a-biophysicist
ES	Committee on Diversity and Inclusion generates internal lists for the consideration of Annual Meeting Steering Committee	Internal, not available for public use
Vallence et al., 2019	List of neuroscientists classified by scientific impact (publications) and gender	https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0220481
American Physical Society	Two lists available: – List of ethnic minority physicists (refers to Hispanic American, African American, and Native American backgrounds) – List of female-identifying physicists	https://www.aps.org/programs/minorities/speakers/index.cfm https://www.aps.org/programs/women/speakers/index.cfm
Glass et al., 2018	Provides access to numerous databases based on demographic information of interest	https://docs.google.com/document/d/e/2PACX-1vSlvHTZtOc6wG5C9xEc-bAIYofpeDhVjrrVc7Q_5IQdmXcLeaYd27nhoJD9jub_q-qALxHknMGbggb/pub
Diversify STEM Conferences	Database that provides lists of URM speakers based on scientific discipline	https://dscnatl.org/speakers-list/
Black In Neuro.	Searchable profile pages allow for the identification of black neuroscientists by areas such as expertise, career stage, and affiliation with historically black colleges and universities (HBCU).	https://www.blackinneuro.com/
Antentor O. Hinton, Jr., PhD/Cell Press	<i>100 Inspiring Black Scientists in America</i> , lists black scientists by career stage—established and early-career (“Rising Stars”) investigators	http://crosstalk.cell.com/blog/100-inspiring-black-scientists-in-america
Antentor O. Hinton, Jr., PhD/Cell Press	<i>100 More Inspiring Black Scientists in America</i> , lists black scientists by career stage—established and early-career (“Rising Stars”) investigators	http://crosstalk.cell.com/blog/100-more-inspiring-black-scientists-in-america
Anne Churchland/Lamiaie Abdeladim	Highlights female systems neuroscientists, categorized by expertise into subject areas, created to aid in choosing speakers for the Cosyne and other conferences	https://anneslist.net/
Jeffrey Schinske/Kimberly Tanner	Scientist spotlights are built by college and university students, particularly those from groups underrepresented in STEM. One of the goals of the project is to highlight science role models to students as they learn scientific content.	https://scientistspotlights.org/
Christina Termini/Cell Press	<i>100 Inspiring Hispanic/Latinx scientists in America</i> , lists Hispanic/Latinx scientists by career stage—established and early-career (“Rising Stars”) investigators	http://crosstalk.cell.com/blog/100-inspiring-hispanic-latinx-scientists-in-america

TABLE 2: Speaker referral lists or similar resources that facilitate identification of scientists from different backgrounds and demographics in STEM.

(Myers et al., 2020). While all researchers have been affected by these new circumstances, a recent study shows that women reported larger declines than men in time devoted to their scientific research (Myers et al., 2020). In fact, journals are already reporting

a noticeable decrease in submissions from women (Andersen et al., 2020; Gabster et al., 2020). Populations that are underrepresented in STEM are also being disproportionately affected by the COVID-19 crisis (Krouse, 2020; Price-Haywood et al., 2020).

These differences represent a threat that may further widen disparities in STEM fields. The long-term effects of these disparities could result in declines in representation of these groups in scientific research publications and programming, likely reversing the benefits of years of STEM inclusivity efforts. Even as science continues to move forward, there will be an increased need to support UR membership of STEM societies through approaches such as diverse speaker selection.

Recommendations

Build diversity, equity, and inclusion into a society's mission and strategic plan. ACCESS societies find that building diversity, equity, and inclusion goals into our missions and strategic planning facilitates the implementation of inclusive practices and associated data collection. This practice helps share the responsibility of diversity, equity, and inclusion with all society membership, including those who select speakers, rather than confining responsibility to its diversity-focused committee(s).

Assess demographics of presenting authors. Evaluating progress and outcomes by regularly and effectively assessing the demographics of society membership and/or presenting authors at their annual meetings can inform inclusion efforts in valuable ways. ACCESS recommends that societies assess speaker diversity at each of their annual meetings. Tracking data over time and finding trends will help guide implementation of effective and sustainable evidence-based changes.

Developing standard operating procedures to facilitate inclusive practices. A good way to retain organizational memory of effective practices is to establish standard operating procedures (SOPs), selection rubrics, and documents such as open calls for participation in selection committees to provide direction to leadership and committees responsible for annual meeting program planning. This is particularly important due to the turnover that typically occurs among the members of society committees charged with tasks such as implementing speaker selection strategies and generating speaker referral lists. SOPs and selection rubrics can be an effective way to maintain organizational memory of inclusive practices. ACCESS members have consistently found that the SOPs and other tools that work best are those that are regularly revised and adapted to fit current needs.

Implementing strategically moderated remote scientific programming. While scientific annual meetings held remotely or virtually due to the COVID-19 crisis have decreased the access to interactions that scientists usually have with peers and trainees from different backgrounds, these formats have also increased the reach of scientific information to an unprecedented degree. This is an additional opportunity for our remote scientific programming to be more inclusive of scientist speakers from UR demographic backgrounds. Additionally, virtual conferencing can create more inclusive spaces through intentional and active moderation to ensure inclusion of UR scientists from all academic stages in discussions and Q&A sessions. Encouraging participation from UR members in virtual annual meetings can bolster our societies' diversity, equity, and inclusion efforts.

CONCLUSIONS

Collectively, these efforts to integrate diversity and inclusion into annual meeting speaker selection can improve the experience both for UR society members and for the wider community of at-

tendees. Opportunities exist for all society members to contribute to placing diversity and inclusion at the forefront of decision-making, including by disclosing demographic information during registration or membership processes and by holding positions on speaker-selection committees. Scientific societies and meta-organizations such as ACCESS can further optimize inclusive practices by collecting outcomes data that inform the efficacy of strategies such as increased planning timelines for annual meeting programming and tools such as open calls to increase UR scientist representation on speaker-selection committees. By creating annual meeting programming that is representative of all identities, we can maximize the creative capital, collaborative potential, and overall productivity of our respective fields of interest while creating a scientific home for all.

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