American Society for Microbiology Response to
Request for Information (RFI): Inviting Comments and Suggestions to Advance and Strengthen

Background: ASM's Programs Dedicated to Supporting Underrepresented Groups

ASM has a strong and robust history of supporting scientists from historically excluded and underrepresented groups. The most notable ASM programs in this area are the student research fellowships and the Annual Biomedical Conference for Minority Students (ABRCMS)[2]. Neither of these efforts would have been possible were it not for support from NIH. As ASM looks to increase its role in advancing the education and career trajectory of an increasingly diverse workforce, we expect there will be additional opportunities to collaborate with NIH.

ASM has a long history of partnering with NIH to support scientists from underrepresented groups across the life sciences. An exemplar program is ABRCMS. In 2000, the NIH named ASM a sole partner in sponsorship of the largest undergraduate student STEM conference dedicated to underrepresented and historically excluded groups. In nearly two decades, ABRCMS became the premier undergraduate student STEM conference serving over 5,000 participants annually. The conference aims to allow:

1. Undergraduates to share their research project data and demonstrate scientific expertise.
2. Undergraduates to prepare for successful transition to graduate or professional education, training, and research careers.
3. Undergraduates to prepare for the evolving, global, and interdisciplinary nature of biomedical and behavioral sciences research and careers.
4. Faculty advisors, research scientists, and program directors to develop professionally as biomedical scientists, advisors, educators, and leaders.

Since its founding, ABRCMS has served >62,000 participants from all 50 states, Puerto Rico, Guam, and more recently, internationally. Since 2005, attendance at the conference has more than doubled to ~5,200 participants, a significant proportion of whom are women (62%), with ~73% of the attendees coming from groups underrepresented in science **(Table 1)**. Over this period, the number of student presentations increased by nearly 300% (707 in 2001 to 2,676 in 2019), and while the initial intention was to provide a conference targeted towards undergraduate students, the ABRCMS leaders acknowledged the immense benefit towards undergraduates and worked to extend the impact to include graduate students and postdoctoral fellows.

Table 1. Undergraduate, Postbaccalaureate, and Graduate Student Populations at ABRCMS (%)

Race or Ethnicity	2005	2010	2015	2019
Asian American	3.36	3.78	5.38	6.79
Biracial	-	-	-	

In addition to ABRCMS, ASM has a long history of supporting underrepresented groups through fellowship programs. In 1980, ASM launched the first national fellowship program for underrepresented graduate students in the microbial sciences, now known as the Watkins Fellowship. ASM also partnered, in the past, with NIH's National Institute of General Medical Sciences (NIGMS) through the Minority Access to Research Careers in the Biomedical and Biological Science (MARC) Program to sponsor a summer research fellowship for undergraduate students to conduct research. This program recruited students fsudefa36.3(ude)-1.dor1.7(s)-2.39(.3(S)]TJ 69 Tw [(a66(f7.924(e)-1.6(s 0.6l0.005 Tc w [(l)63(s)163272 0 T

across the STEM fields.[6] To combat the perpetuation of exclusion and lack of diversity, we must affirm the extent to which we, as the entire STEM community, are prepared to evolve programs and projects to achieve the broader goal of inclusive diversity.

In the process of evolving these programs, we must solidify our intention to attract, grow, and continue attracting the dynamic and diverse groups of historically excluded scientists that will build and enhance the future of the biomedical sciences. To do this, we need to identify ways to demolish the systemic barriers that perpetuate the exclusion of groups that fall outside of teEsi r3MCID 1 >>1.9utsit gsM e 7(xc)-1.6(l)9(fi),s.c

As a scientific society, ASM has the capability of defining best practice, establishing guidelines and working across the career trajectory to enable a consistent approach throughout the professional and academic fields of STEM across the globe. By building new and enhancing existing influences, partnerships, and/or collaborations with both the internal NIH workforce and the NIH-funded biomedical research enterprise, as well as academic institutions, ASM will be better positioned to coordinate, contribute to, and execute these initiatives.

Factors that present obstacles to training, mentoring, or career path (e.g., training environments) leading to underrepresentation of groups in the biomedical research enterprise throughout the educational and career continuum and proposed solutions (novel or proven effective) to address them

It is apparent that equitable representation is not present in the STEM field. The recent ASM DEI Taskforce Report[7] spotlighted this by acknowledging that historically, women and BIPOC are underrepresented in participation in ASM activities and leadership roles. To examine the underrepresentation of certain groups, in 2015, ASM investigated the gender equity of podium presenters at ASM's annual meeting.[8] This study identified that the proportion of women speakers was 28% in 2011 and after deliberate actions taken by the meeting organizers, the society was able to achieve better gender parity by 2015 with 48.5% of the podium presentation being delivered by women.[8] The mechanisms identified in the studies that facilitated movement towards gender parity at ASM's annual meeting are:

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were centralized to provide greater uniformity in responding to ethics issues across the society.

In addition to scientific misconduct, the broader scientific community has become acutely aware of the prevalence of professional misconduct, including harassment and bullying. Accordingly, ASM developed and implemented its Events Code of Conduct[14] to address sexual harassment and other forms of harassment. We expressly prohibit and outline a zero tolerance policy for harassment or bullying of any kind, and we have established an anonymous reporting mechanism through which complaints can be reported and responses made. ASM also broadened its membership "Code of Ethics" to reflect the importance of this policy to "Code of Ethics and Conduct."[15] As such, ASM members shall avoid conflicts of interest, professional, misconduct, and potential abuse of privileged positions, including the recognition of the potential power differential between mentors and trainees.

In order to move the STEM field toward inclusivity, it will require substantial investment, both financial and temporal. STEM, as a field must realize that the service-based enterprise limits access, as many individuals do not have the resources needed to develop their career traditionally (i.e., unpaid internship, unpaid volunteer work, etc.). STEM must commit to investing in the next generation of scientists to such an extent that our future leaders are compensated for their time, expertise, and invaluable contributions that ultimately sustain, grow, and progress the field. Innovatively remodeling the current approaches to incorporate the service-oriented enterprise will assist in removing such barriers that prevent access. The National Summer Undergraduate Research Project (NSURP)[16] launched in response to the COVID-19 pandemic is an example of such remodeling and provided virtual research opportunities where researchers are not required to be physically present in the lab to participate in program activities. Remodeling to provide virtual and/or remote opportunities so researchers are not required to be physically present in the lab during the training process, would help decrease the travel and/or relocation costs most researchers must self-provide in order to participate in programs, thus providing greater accessibility and inclusivity. Collectively bringing these topics to the attention of policy makers, ASM hosted a webinar[17], in fall of 2020, dedicated to understanding how to better support underrepresented groups in the STEM fields.

An additional barrier hindering the flourishment and inclusion of all groups, especially those historically underrepresented in STEM, is the process of advancing through an academic's careers, such as the recruitment and selection, retention and tenure, and recognition and contribution an individual must engage in, to ensure success. We must pay attention to the issue of supporting, retaining, and fully utilizing the talent of individuals historically underrepresented in STEM. To address this, in 2020, ASM introduced a new criterion for broadening participation of scientists from non-traditional groups to its honorific branch of the ASM, the American Academy of Microbiology (AAM). ASM developed these criteria because the Academy is aware that there are excellent scientists from underrepresented groups who deserve this honor but are rarely nominated. In 2020 and beyond, fellows are encouraged and empowered to nominate scientists who come from diverse backgrounds for election to fellowship in the Academy. Additionally, ASM is currently revisiting its nomination process with the goal of ensuring inclusion and representation from historically excluded and underrepresented scientists in the microbial sciences and provide greater access to ASM volunteer opportunities. ASM will be piloting a new process in 2021, will analyze the results in 2022 and formally incorporate the successful revisions.

[14] https://asm.org/Articles/Meetings/ASM-Events-Code-of-Conduct
[15] https://asm.org/Articles/Ethics/COEs/ASM-Code-of-Ethics-and-Conduct
[16] https://nsurp.org/
[17] https://asm.org/Webinars/Strengthening-Career-Pathways-in-Science-for-Under

Conclusion

Addressing the systemic barriers within STEM and elevating DEI to the forefront of the field will take a