



FASEB

Federation of American Societies
for Experimental Biology

Representing Over 130,000 Researchers

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The Federation of American Societies for Experimental Biology (FASEB) appreciates the opportunity to provide feedback to the Request for Information (RFI) issued by the National Institute of General Medical Sciences (NIGMS), “[Strategies for Enhancing Postdoctoral Career Transitions to Promote Faculty Diversity](#).” FASEB comprises 30 scientific societies representing over 130,000 researchers, clinicians, and engineers in the biological and biomedical sciences. To provide the most comprehensive representation of Federation and individual society activities to enhance postdoctoral career transitions and promote faculty diversity, programmatic information was collected from FASEB member societies and FASEB’s Office of Sponsored Programs, Diversity and Grants Administration (OSPDGA). This information was supplemented by feedback from advanced graduate students and postdoctoral fellows who participated in the 2018 Postdoctoral Preparation Institute (PPI) program organized by OSPDGA with support from NIGMS. The Federation is committed to help identify, develop, and implement new strategies that will enhance successful career transitions for postdoctoral scientists who come from underrepresented groups in biomedical research, and looks forward to working with NIGMS on this important issue.

1. The barriers scientists from underrepresented groups face as they progress from postdoctoral training into faculty positions at research-intensive institutions, and potential strategies to overcome these barriers.

The comments included in this response were collected from the population of interest (late-stage graduate students and postdoctoral fellows, mostly from groups underrepresented in biomedical research) who attended this year’s [FASEB Postdoctoral Preparation Institute \(PPI\)](#) in Minneapolis, MN. The PPI is a two-day workshop that provides participants with resources for various career pathways, as well as opportunities for career and professional development in the biomedical research workforce. The responses collected reflect the participants’ personal experiences and perceptions on barriers they encounter as they progress from postdoctoral training into faculty positions at research-intensive institutions.

Identified barriers fell into five general themes:

- 1) Lack of effective mentoring, particularly for first-generation college/graduate students who may require additional counseling
- 2) Feelings of inadequacy/incompetency, such as suffering from the “imposter syndrome” and microaggressions experienced within the laboratory/institutional environment
- 3) Experiencing cultural and institutional biases from faculty and institutional leadership
- 4) Limited financial and professional resources for underrepresented groups

- 5) Over-commitment in terms of being asked to lead diversity initiatives and/or serve on committees, taking time away from the ability to fulfill their duties of conducting research or leading a laboratory.

Strategies that can help overcome these barriers:

- 1) Providing mentee/mentor training that complies with the [National Research Mentoring Network](#) (NRMN) standards and resources (some FASEB member societies are already NRMN partners). It is critical to advise mentees that it is acceptable to have multiple mentors within academia and outside of academia
- 2) Supporting access to mental health resources, supportive peer networks, fellowships, internships, and leadership training for underrepresented scientists to ensure their success in their scientific careers
- 3) Providing diversity, civility, and unconscious bias training to all faculty and institutional leadership in order to create a more inclusive environment, including not penalizing or harassing trainees for religious or family obligations
- 4) Offering funding opportunities that include scholarships, grants and/or fellowships specifically for underrepresented scientists
- 5) Establishing clear and flexible expectations for new and/or underrepresented faculty members, including limits on non-research obligations. This could include providing detailed promotion and tenure criteria to newly hired faculty, and making adjustments based on research and mentoring activities as well as personal professional goals.

The personal experiences and perceptions collected from the PPI participants align with those identified in the current literature. Information regarding strategies, resources, and programs offered by FASEB member societies to promote additional opportunities for scientists and clinicians to become successful in their careers is provided in our response to Question 4.

2. The qualities and perspective that scientists from underrepresented groups bring to the research enterprise, and how these can be drawn upon to encourage and promote career transitions into the professoriate at research-intensive institutions.

Scientists from underrepresented groups bring creativity, resilience, cultural values and international awareness to the research enterprise, all of which are essential to providing a broad scope and diverse perspective to new or on-going projects. Many underrepresented scientists have experienced and overcome economic, personal, and professional setbacks during their training, instilling in them the grit and resolve necessary to surmount workplace challenges that may arise. Many underrepresented and/or

first-generation scientists share a desire to serve as mentors and role models to future generations (starting from elementary school to the postdoctoral level), helping them to relate to other trainees with similar backgrounds, and providing constructive feedback. Having a diverse pool of scientists and role models with these qualities increases the number of underrepresented groups enrolling and pursuing faculty positions in the biomedical sciences at research-intensive institutions.

3. Approaches that key stakeholders (e.g., faculty advisors, institutions, scientific societies, etc.) can employ to promote the successful career transitions of postdoctoral scientists from underrepresented groups into the professoriate at research-intensive institutions, and how these can be coordinated and sustained to maximize impact.

A. Approaches

As a coalition of 30 professional societies united by our mission to advance health and well-being by promoting research and education in biological and biomedical sciences, FASEB is committed to fostering a research workforce that is diverse and inclusive. The FASEB OSPDGA, which oversees the FASEB [Maximizing Access to Research Careers \(MARC\)](#) and [Diversity Resources for Enrichment, Access, and Mentoring \(DREAM\)](#) programs, and the minority affairs committees and staff of our member societies have, for decades, undertaken activities and interventions designed to provide trainees from underrepresented groups with educational and career development opportunities and access to resources they might not otherwise get. We grouped these approaches into four categories based on their primary intent: mentoring, networking, fellowships and travel awards, and leadership experience. Although the focus of the RFI is postdoc-to-faculty transitions, we believe providing academic and professional support to trainees from underrepresented groups is critical to keeping them in the biomedical workforce “pipeline” until they reach the postdoc stage; therefore, many of the programs outlined here are open to trainees at multiple stages, not just postdocs.

Mentoring. Mentoring has been shown in the literature to be one of the most effective means of setting people up for success. When the mentoring relationship works properly, mentees come away with a greater sense of self-confidence, knowledge of their strengths and weaknesses, and a better understanding of how to reach their career goals. The NRMN helps trainees expand the number and breadth of their mentors by connecting them with professionals across numerous career stages, professions, locations, racial and ethnic groups, and more. FASEB and five of its member societies—the American Physiological Society (APS), the American Society for Biochemistry and Molecular Biology (ASBMB), the Association of Biomolecular Resource Facilities, the Genetics Society of America, and the Society for Developmental Biology—are NRMN partners, which means they work to build awareness of their mission through offering NRMN programs and workshops.

In addition to NRMN, many member societies sponsor their own mentoring activities. The American Society for Pharmacology and Experimental Therapeutics (ASPET) started its own [Mentoring Network](#) in

2016 based on the career coaching model developed by Rick McGee, PhD. The goal of the ASPET network is to provide career guidance to trainees and to promote diversity in pharmacology careers. Small groups of gender-balanced, racially/ethnically mixed graduate students and postdocs meet in-person prior to the Experimental Biology meeting for training and facilitated discussions. This is followed by a year of monthly, virtual meetings to discuss careers, transitions, skills, and implicit bias. Additionally, there are one-on-one interactions between coaches and mentees, and peer mentoring is encouraged. Evaluations from the first cohort revealed mentees were satisfied (or better) with their participation and felt their career choices were more achievable. The American Society of Human Genetics (ASHG) offers a mentoring session for trainees from underrepresented groups at the [Diversity Breakfast](#) during its annual meeting. The session focuses on training and career opportunities in genetics and genomics. The [American Association of Immunologists' \(AAI's\) Minority Affairs Committee \(MAC\)](#) maintains a list of members from underrepresented groups who have volunteered to be a part of a mentoring and networking community within AAI. Additionally, MAC members mentor AAI Young Scholars awardees on their research and presentation skills during the annual meeting.

Networking. Providing opportunities for virtual and in-person networking for members from underrepresented groups is a key function of professional societies, including FASEB MARC and FASEB member societies. The American Society for Bone and Mineral Research (ASBMR) sponsors one underrepresented postdoc member per year to attend the [Network of Minority Health Researchers Annual Workshop](#), which is organized by the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK). In addition to networking opportunities, the workshop offers mentoring on career advancement. The ASBMR Diversity in Bone and Mineral Research Committee sponsors an [interactive networking reception](#) for underrepresented minorities at its annual meeting. The Society of Toxicology (SOT's) Postdoc Association organizes a [speed networking event](#) at its annual meeting, giving postdocs the opportunity to network with mid- and late-career mentors from a variety of toxicology-related occupations. AAI's MAC sponsors the "[AAI Careers and Networking Roundtable](#)" program for early- and mid-career members at their annual meeting.

Fellowships and Travel Awards. The FASEB MARC program is known throughout the scientific community for the [travel awards](#) it provides to trainees and faculty from underrepresented groups; since 1991 it has provided over 5,000 travel awards to FASEB member societies' meetings. For the 2017 Experimental Biology meeting, for example, FASEB MARC supported 41 travel awards, 88 percent of which went to racial/ethnic minorities. Moreover, 61 percent of awardees reported that they would not have been able to attend the meeting without the MARC travel award. Another example is the [ASHG/FASEB Mentored Travel Awards](#) for Underrepresented Trainees, which provide complimentary registration plus travel funds for the ASHG annual meeting to undergraduate and graduate students, postdocs, and medical students from minority institutions and historically black colleges and universities, as well as underrepresented individuals at majority institutions. Each awardee is paired with a peer mentor for the meeting who helps him/her navigate the meeting and network and provides career advice. In

addition, the mentors themselves are often postdocs from underrepresented groups, and receive support to defray their own travel costs. Awardees of the ASHG/FASEB Mentored Travel Awards report increased confidence in themselves and in reaching their career goals.

SOT offers funding for graduate students to participate in an activity/experience to supplement the training provided through their graduate programs; those planning academic careers have put the funding towards training in computation and other research techniques. Along similar lines, the FASEB DREAM program has supported travel awards to AAI summer courses in immunology. Although not yet funded, APS has submitted a grant application to NIH to support its Career and Professional Development Fellowship program. The two-year fellowship would allow graduate students or postdocs from underrepresented groups to develop research and career development skills while receiving mentoring from APS members. Finally, as part of its recent strategic planning activities, the American Association of Anatomists (AAA) has planned to develop a program by 2019 to fund travel and/or research activities in Anatomy by trainees from underrepresented groups.

Leadership Experiences. The American College of Sports Medicine (ACSM) created its [Leadership and Diversity Training Program](#) in 2006-2007. Participants receive mentorship from ACSM Fellows, with the goal of increasing the diversity of society leadership. The [ASHG/JAX Conference to Career Program](#), a collaborative effort between ASHG and The Jackson Laboratory, seeks to enhance the professional and career development of graduate students and postdocs. Through a face-to-face session at the ASHG annual meeting along with monthly webinars, participants focus on optimizing their time at meetings with effective networking and communication skills. [The Vanguard Lecture at the AAI annual meeting](#) is presented by a member from an underrepresented population who has demonstrated noteworthy scientific achievement and career success. SOT has graduate student and postdoc representative positions for each of its regional chapters, specialty sections, and special interest groups; these representatives aid in the planning and organizing of activities. This group of trainee representatives also elects officers that plan sessions for the SOT annual meeting. Most APS committees have a slot specifically for a trainee member, and for the [Porter Physiology Development and Minority Affairs Committee](#), this is reserved for a past Porter Fellow. Additionally, the APS recently submitted a grant to NIDDK to support its Career Advancement through Skills Development, Society Involvement and Leadership (CASSL) program. One of the few programs described here designed specifically for scientists from underrepresented groups and those with physical disabilities, CASSL would provide early- and mid-career researchers with additional training in research and leadership skills. Participants would increase their role and visibility in APS as well as their home institutions. One of the long-term goals spelled out by AAA in its diversity and inclusion plan is to increase the representation of individuals from diverse and underrepresented groups in its leadership, with the objective of achieving parity with, or exceeding, the diversity in the general membership by 2025.

B. Coordination

Coordination to sustain and maximize impact of programs such as those described above could be done through alliances and/or consortia. The recently-initiated [Alliance of Scientific Societies for the Development of the Next Generation of Scientists](#), which aims to coordinate efforts among scientific societies to understand effective interventions to build a more diverse and inclusive workforce, is an excellent example. Having secured three years of support from the National Science Foundation, the Alliance will develop best practices and evaluation metrics, and a database of STEM diversity programs, and make them available to the entire scientific community. A non-professional society example is the [Big Ten Academic Alliance](#), which has a grant through NRMN to train facilitators for a mentor training curriculum (“Mentor Training for Clinical and Translational Researchers”). This alliance serves the dual purpose of providing faculty with mentor training and ensuring high standards and practices across Big Ten campuses. Participating faculty have reported changing their mentoring style as a result of the training and found it a valuable use of time. Similar efforts surely exist in other academic conferences and for other research and training purposes and can be used to broaden the use of best practices throughout research institutions.

FASEB itself, through the OSPDGA and its member societies, can disseminate identified best practices concerning diversity and inclusion. Indeed, three of the six founding members of the Alliance of Scientific Societies are FASEB member societies: ASBMB, ASPET, and the Endocrine Society, and there is the possibility that more could join. The [Experimental Biology meeting](#), which serves as the annual meeting for five FASEB member societies, could be a testing ground for sharing information and best practices across societies, and for piloting multi-society diversity initiatives. Similarly, best practices could be shared more widely at meetings of the FASEB Diversity Roundtable Discussions Groups, which comprises minority affairs committee chairs and/or staff from OSPDGA and most FASEB member societies.

4. Current strategies that have been successful in promoting the transition of postdoctoral scientists from underrepresented groups into independent, tenure-track faculty positions.

The programs showcased are all intended to impart trainees with additional, specialized skills and knowledge that will enable them to succeed in their chosen career path. Additionally, participation in these programs is not limited—in some cases not even open—to postdoctoral scientists. However, qualitative evaluations from these programs indicate that past participants consider their involvement to have been a contributing factor in them achieving faculty status.

The [“Future Leaders Advancing Research in Endocrinology,”](#) or FLARE, program from the Endocrine Society was created specifically to promote transitions of graduate students, postdocs, and clinical fellows from underrepresented groups to independent research careers. Begun in 2012 with support from NIDDK, FLARE features a two-day leadership training workshop and a choice of two “tracks:” the internship path or the mentorship path. During the workshop fellows focus on networking with their peers, program

leaders, and invited speakers; they also attend skill-building sessions on securing funding, time and team management, negotiation, and marketing oneself. Those who choose the internship path undertake one year of service on an Endocrine Society committee or apply to participate in the Keystone Symposia Fellows program; these experiences increase the trainees' networks and teach them about associations/non-profits. The mentorship path allows for more in-depth mentoring from an accomplished biomedical or clinical scientist who is not the fellow's academic mentor, providing support for both in-person and virtual mentoring sessions. FLARE boasts more than 100 fellows to-date. **Of the first three cohorts of FLARE fellows (2013-2015), 36 percent successfully transitioned from postdocs to academic junior faculty positions.**

The [American Physiology Society's \(APS's\) Porter Physiology Development Fellowship](#) provides one-to-two years of support for full-time graduate students from underrepresented populations to pursue their doctorates in the physiological sciences. The Fellowship provides an annual stipend equivalent to the NIH National Research Service Award (NRSA) predoctoral fellowship, mentoring by members of the APS Porter Physiology Development and Minority Affairs Committee, access to a wealth of online networking and skills development resources, and opportunities for professional service, including K-12 outreach. The Porter Fellowship has been in existence since 1967, and has supported 140 Fellows (through 2017). An impressive 63 percent of Fellows identify as African American/Black, with 34 percent identifying as Hispanic/Latino, 2 percent American Indian/Alaska Native, and 1 percent Native Hawaiian/Pacific Islander. In addition, over half (55 percent) are female. **73 percent of Porter Fellows report being employed in academia and 60 percent describe their area of employment as research.** Anecdotally, there are numerous assistant, associate, and full professors among them. But there are no precise data on career path or current title, so it is unclear how many were successful in the postdoc-to-faculty transition.

[SOT's Undergraduate Diversity Program](#) has been working with students from underrepresented groups, as well as those from Academic Research Enhancement Award (AREA)-eligible schools, for 30 years. Students are funded to attend the SOT annual meeting, where mentoring groups are formed. In addition, students learn about graduate school and careers in toxicology, and are encouraged to network with toxicology professionals (including academics). After the annual meeting, program participants are encouraged to find internships to gain and/or focus research experiences. Mentors in the Program are instrumental in identifying internships for the students, and importantly, SOT provides matching support or internship hosts. While many participants go on to careers in industry and government, **as of 2004, at least 27 student participants had earned their PhDs, and at least 4 have gone on to faculty positions.** The actual numbers for both doctorates earned and faculty alumni could be higher; SOT, like many professional societies, lacks sufficient funding to track program participants as frequently and at the level of detail as it would prefer to do.

The [FASEB MARC PPI](#), a workshop to help early career researchers understand and transition to independent careers, is another example of an intervention offered by FASEB with a demonstrated track

record of promoting the postdoc-to-faculty transition. PPI is open to anyone, although trainees from underrepresented groups are encouraged to apply, and travel awards are available to legal U.S. citizens and residents. Participants receive one-on-one help with their CVs/resumes, and have opportunities to network with fellow trainees and invited speakers. They hear presentations on career development skills such as preparing competitive job and grant applications, interviewing, and negotiating, and are introduced to careers outside academia. **As of June 2018, 25 out of 88 2014 PPI participants, and 8 of 82 2016 participants, have transitioned to Assistant Professor positions.** Moreover, in a 2016 survey of 2014 participants, 93 percent of respondents (56 percent response rate) said the knowledge and skills they gained at PPI contributed to them transitioning out of a postdoc position (although not necessarily into a faculty position).