

**Submission by The American Association of Immunologists (AAI) to
the National Institutes of Health (NIH) Request for Information (RFI):
Suggestions to Advance and Strengthen Racial Equity, Diversity, and Inclusion in the
Biomedical Research Workforce and Advance Health Disparities and Health Equity Research**

April 9, 2021

As a founding member of the Federation of American Societies for Experimental Biology (FASEB), The American Association of Immunologists (AAI) is pleased to endorse the comprehensive and thoughtful recommendations FASEB submitted to the National Institutes of Health (NIH) in response to this RFI. As the nation's largest professional association of research scientists and physicians who are dedicated to understanding the immune system through basic, translational, and clinical research, AAI would like to further emphasize the following areas of importance.

Overall

AAI and its membership understand the professional and societal benefits of diversity, equity, and inclusion (DEI) in the biomedical research workforce and view successful and sustained DEI as critical to advancing scientific understanding.

Progress to enhance DEI in immunology has been steady due to collective efforts by professional associations, academic and other institutions, and NIH/other government agencies which have funded programs aimed at supporting women and underrepresented minority (URM) scientists throughout the career pipeline. DEI efforts have shown gains over the past twenty years; however, this is not reflected in leadership and key decision-making positions. Significant barriers remain. Thus, creative strategies are needed to continue to increase the pool of women and URM biomedical researchers, provide needed support to help them thrive, and foster their ability to become institutional leaders and decision-makers.

As a professional association, AAI has long been committed to advancing the careers of women and other underrepresented immunologists. Through the leadership of AAI, the [AAI Committee on the Status of Women](#) (CSOW), and the [AAI Minority Affairs Committee](#) (MAC), these scientists have found additional professional support; for example, focused attention has been given to the representation of women and minorities as speakers at the AAI annual scientific meetings and as members on AAI committees. AAI has a special honorific lecture - the Vanguard Lecture - which honors a URM scientist with a lecture at the AAI annual scientific meeting. This lecture not only highlights outstanding scientific achievement, but also sets an example for future generations of scientists. AAI also provides travel support to the annual scientific meeting to emerging URM faculty. Both the CSOW and MAC sponsor other events at the AAI annual scientific meeting, including roundtable sessions that introduce attendees to a wide array of career options and allow discussion about career challenges with which they are confronted. It also gives participants the opportunity to interact with potential mentors. AAI also hosts voluntary databases of Women and Minority Speakers and Mentors, available to both AAI members and the community at large, which are a resource of potential speakers, editors, mentors, study section members, etc. To broaden the impact of its efforts, the MAC partners with the Annual

Biomedical Research Conference for Minority Students (ABRCMS) to support undergraduate students pursuing careers in biomedical research. Therefore, AAI and other professional societies already do serve – and would welcome the opportunity to work with NIH to further serve – as a resource for enhancing DEI in our own disciplines and in the broader biomedical research workforce.

Education and training

It is important to highlight the need for scientists to participate in all sectors (e.g., academia, industry, government, non-profit) and assist early-career scientists with appreciating that science is advanced in a variety of ways beyond the laboratory or clinic. Programs that introduce trainees to different biomedical research careers, such as the NIH-funded Broadening Experiences in Scientific Training (BEST) awards, should continue and showcase that career success occurs beyond academia. If we are to generate the strongest pipeline of biomedical research trainees, they should be made aware of a wide range of career paths and provided the skills they need to be successful in each. Training and education regarding biomedical research careers should begin earlier in the pipeline – K through 12 stages – to capture and foster student interest in science. (*highlighted in FASEB response, point #2*).

Support systems

Many scientists from underrepresented communities are the first in their family to pursue careers in science. This can be daunting, with no one to provide insight on what to expect, and can lead to feelings of isolation when there are few other underrepresented scientists in their training cohort or departments. Women pursuing careers in male-dominated fields face a similar plight. They also tend to be the primary caregiver in raising children or taking care of parents. It is important to promote cultural competency and provide resources for these groups to feel supported as they continue to advance in their careers (*highlighted in FASEB response, point #4*).



FASEB comments in response to [NOT-OD-21-066](#), “Inviting Comments and Suggestions to Advance and Strengthen Racial Equity, Diversity, and Inclusion in the Biomedical Research Workforce and Advance Health Disparities and Health Equity Research”

Comments submitted electronically via online [Comment Form](#) on April 6, 2021

Perception and reputation of NIH as an organization, specifically as an employer (e.g., culture), with respect to support of workforce diversity and as an overall advocate for racial and gender equity in NIH-funded research.

Demographic [data on the total NIH workforce](#) as of September 2020 indicates the intramural program has made great strides towards equity. Comparing to [2019 census population estimates](#), intramural workers are well represented at almost 60 percent female compared to 50.8 percent from the general United States population, 20.6 percent Black compared to 13.4 percent from the census, and 19.1 percent Asian compared to 5.9 percent from the census. However, NIH lags in proportionate representation compared to the general population in intramural staff who are Hispanic, two or more races, American Indian and Alaska Native, and Native Hawaiian and other Pacific Islander.

Furthermore, while the total NIH intramural workforce is fairly diverse, personnel [data from the Office of Intramural Research](#) indicates that intramural research program principal investigators and branch chiefs are primarily White and male. Recruitment of diverse individuals is just the first step. It is vital that NIH take action to ensure individuals from historically excluded groups are promoted into positions of meaningful leadership and power and are represented at all levels of the organization.

Moreover, it is critical that NIH assess prior efforts and initiatives on promoting intramural diversity to understand what has succeeded and what was lackluster. Pre- and post- presentation data collection on webinars featuring topics on diversity may be enlightening. For example, the [NIH Scientific Workforce Diversity Toolkit](#) shows promise via [participant polling](#) in helping to disseminate evidence-based tools. As feasible, metrics on inclusive environments and culture change should be measured and evaluated. A pilot study could be conducted longitudinally with participants in the [NIH Distinguished Scholars Program](#), and qualitative data collected must be considered. Culture change often provokes emotional reactions, which may be difficult to measure quantitatively, but [acknowledging these emotions](#) is key to engagement with change. Moving forward, it is important NIH evaluate past efforts to enhance intramural diversity to pivot away from initiatives that had little or no impact and importantly build upon programs that have shown success.

New or existing influence, partnerships, or collaborations NIH could leverage to enhance its outreach and presence with regards to workforce diversity (both the internal NIH workforce and the NIH-funded biomedical research enterprise); including engagement with academic institutions that have shown a historical commitment to educating students from underrepresented groups (especially Historically Black Colleges and Universities (HBCUs), Hispanic-Serving Institutions

(HSIs), Tribal Colleges and Universities (TCUs), and other institutions), racial equity organizations, professional societies, or other federal agencies.

In addition to bolstering its engagement with academic institutions demonstrating a historical commitment to educating students from underrepresented groups, FASEB strongly encourages NIH to actively partner with scientific and professional societies to expand its outreach and foster development and retention of a diverse workforce. The majority of discipline-specific societies include committees devoted to diversity, equity, and inclusion. Such committees serve as the leads for developing and implementing programs to improve the recruitment and retention of researchers from underrepresented backgrounds. Similarly, affinity organizations centered on individual identities, such as [Society for Advancement of Chicanos/Hispanics and Native Americans in Science \(SACNAS\)](#), [Out in Science, Technology, Engineering, and Mathematics \(oSTEM\)](#), [Association for Women in Science \(AWIS\)](#), and the [American Indian Science and Engineering Society \(AISES\)](#) offer impressive networks wherein members can enhance their research skills and expand their professional networks.

Development of a robust and diverse biomedical workforce is dependent upon students gaining early exposure and interest in science and research. Many programs emphasize development of the academic research workforce from undergraduate education through doctorate and postdoctorate training. Success of these programs are dependent upon student interest and experience in scientific research well before undergraduate training. Therefore, we urge NIH and other federal agencies supporting scientific research to partner with the Department of Education and organizations focused on K-12 learning, such as the [National Science Teaching Association](#), to foster interest in science much earlier in a student's education.

Finally, when engaging in these outreach activities, we encourage NIH to help highlight the range of career opportunities available within the biomedical sciences. Far too often, students and trainees perceive success as an academic career path. However, as noted in the [2012 report of the NIH Advisory Committee to the Director Biomedical Workforce Working Group](#), only a small proportion of the biomedical workforce has a tenure-track position at a research university. Highlighting the many ways and venues in which one can contribute to the research enterprise could aid in retaining individuals in the biomedical research workforce.

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

Effective mentorship is a key component in training the next generation of biomedical researchers. The recent National Academies of Sciences, Engineering, and Medicine report, [The Science of Effective Mentorship in STEMM](#), highlights non-dyadic mentoring structures as providing a myriad of benefits, particularly for underrepresented students. Access to a mentor network with varying knowledge, skills, and abilities aids in personal and professional development. However, the apprenticeship structure in science prioritizes dyads between the Principal Investigator (PI) and trainee.

The benefits of mentorship are related to the mentor's skills, motivation, and aptitude. Quality [culturally aware](#) mentorship is a learned skill, and yet traditionally research advisors do not receive

pedagogical mentorship training. Although the paradigm is shifting, promotion and tenure practices often do not account for demonstration of evidence-based mentoring or pedagogical mentorship training.

NIH can lead in shifting these norms of dyadic mentorship structures and lack of training. Criteria for trainee fellowships could be updated to reflect the importance of a mentoring network, rather than rely on the PI to be responsible for majority of training. Eliminating the expectation of a dyadic mentorship structure would fundamentally shift the PIs primary role in the application to be with respect to the science. Then, the trainee could demonstrate support for their professional development with a myriad of individuals in their mentor network. Additional mentors to fulfill the development needs of the trainee past the sponsor(s) should be a scored criterion. The current emphasis on the sponsor does not create an expectation of trainees sustaining a meaningful mentor network.

Furthermore, scored criteria regarding the sponsor(s') track record of mentoring individuals could be revised to include evidence-based mentoring skills and continuous pedagogical training. Currently, judgement of the sponsor(s') ability to mentor is largely undefined, with the number of past trainees placed in desirable positions being a common metric. This penalizes newer PIs and their trainees when the commitment to evidence-based mentoring is not correlated to length of time as a PI. Just as there are senior PIs who do little to mentor students, there are junior PIs who voluntarily undergo mentor training to improve their skills. Scoring the sponsor(s') ability to mentor individuals should reflect the effort to utilize evidence-based mentoring practices.

Moreover, scoring academic records in trainee fellowship applications should be evaluated. There is a growing body of evidence suggesting traditional measures of academic success, such as undergraduate [grade point average](#) and [GRE scores](#), aren't predictors of success in graduate school.

Finally, NIH can create new programs to model the benefits of [sponsorship](#) in addition to mentorship. Sponsors use their power and influence to publicly promote careers of their protégés. Individuals from historically excluded groups may need a sponsor, not only mentors, to progress in their career. While traditionally utilized in the business sector, sponsorship is being incorporated in science. For example, there is a push for sponsorship programs in [academic medicine](#), and a [Drexel University](#) program advances women faculty. An NIH funded formal sponsorship program may help increase diversity in positions of power.

Barriers inhibiting recruitment and hiring, promotion, retention and tenure, including the barriers scientists of underrepresented groups may face in gaining professional promotions, awards, and recognition for scientific or non-scientific contributions (e.g., mentoring, committees), and proven strategies or novel models to overcome and eliminate such barriers.

The National Academies of Sciences, Engineering, and Medicine recently released the "[Promising Practices for Addressing the Underrepresentation of Women in Science, Engineering, and Medicine: Opening Doors](#)" report, which details efforts to improve recruitment, retention, promotion and tenure in academic settings. Although this report is focused on women, many suggested practices may also benefit other historically excluded groups. Importantly, the report acknowledges that actions taken cannot benefit only White women, and that intersectional invisibility is a challenge specific to Black women.

Recruitment is addressed in Chapter 3, and [Box 3-2](#) highlights mentoring programs designed to support diversity and inclusion in the sciences, which may enhance recruitment and retention into

research careers. Chapter 4 features advancement and retention, including innovations in the process of promotion and tenure. For example, [Box 4-4](#) lists programs at institutions of higher education that include efforts to promote diversity, equity, and inclusion in promotion and tenure dossiers. The University of Oregon is further highlighted in [Box 4-5](#) for requiring faculty to incorporate their contributions of promoting equity and inclusion in the promotion and tenure process, and the University of Oregon created a [rubric of examples](#) to help faculty understand this new metric.

Barriers to implementation of evidence-based practices are addressed in [Chapter 5](#). The importance of committed leadership, dedicated financial and human resources, data collection, and an intersectional approach are stressed.

Parenting also poses unique challenges and may act as a barrier to retention; 43 percent of women and 23 percent of men who are new parents [leave full-time STEM employment](#) after their first child. COVID-19 has [exacerbated these stressors](#). As NIH develops new policies, ensuring parents are not pushed out of the pipeline is crucial.

Recommendations for action are described in [Chapter 6](#). [Recommendation 2](#) suggests federal agencies hold grantee institutions accountable for adopting effective practices. [Recommendation 6](#) asks that federal agencies support efforts targeted at addressing underrepresentation throughout the educational and career path. This includes addressing funding disparities for early researchers, particularly women of color. Finally, [recommendation 8](#) encourages federal agencies to recognize and celebrate institutions of higher education that are working to improve gender equity.

NIH has many opportunities to rise to the actions suggested by the National Academies. For example, NIH may help influence this space by incorporating metrics such as evidence of equitable recruitment and promotion and tenure processes in existing funding opportunities or creating new funding mechanisms that help address these issues. The [Faculty Institutional Recruitment for Sustaining Transformation](#) program is an exciting initiative and FASEB looks forward to data measuring success of this cohort model. Furthermore, NIH can also be a standard bearer by tying data collected to extramural funding. Perhaps NIH begins to require extramural institutions to report their personnel demographics to be eligible for funding. Further, NIH may emphasize the importance of diverse personnel and encourage extramural institutions to improve their metrics over five to ten years. Finally, closing funding gaps may be a difficult task, but is necessary to promote equity in the extramural research community.

Successful actions NIH and other institutions and organizations are currently taking to improve representation, equity, and inclusion and/or reduce barriers within the internal NIH workforce and across the broader funded biomedical research enterprise.

The coronavirus pandemic quickly changed realities of daily life for all in the biomedical research ecosystem. FASEB is grateful to NIH for swiftly enacting flexibilities where possible. For example, since the COVID-19 pandemic took hold of the world and forced the majority of scientific trainees to work from home, NIH's Office of Intramural Training and Education (OITE) has been generous in expanding programming to [extramural researchers](#). OITE staff have provided webinars and blog posts on crucial topics dealing with all aspects of career and psychosocial growth—everything from workplace dynamics, mental health, conducting a job search, and more. Access to these materials has benefitted trainees far beyond the intramural workforce, and we hope OITE will continue allowing extramural participation after the pandemic has subsided.

Outside of NIH, other agencies and organizations are also working towards improving equity and removing barriers. Harassment creates hostile environments and may be a driving factor for underrepresented minorities to leave science. Promising practices for addressing harassment collated by [National Science Foundation](#) and National Academies for Sciences, Engineering, and Medicine through the [Action Collaborative on Preventing Sexual Harassment in Higher Education](#) may inspire NIH and other organizations to implement evidence-based practices that have shown success elsewhere. Additionally, professional societies are also making an impact by coming together to establish uniform standards of excellence in STEM fields, including professional conduct, in the [Societies Consortium on Sexual Harassment in STEMM](#). Model policies and implementation tools to cultivate inclusive environments are highlighted in the Societies Consortium [library](#). FASEB is proud to be an inaugural member of the Societies Consortium and continues dedicated work to combat harassment and create safe environments.

Furthermore, FASEB is excited about the newly launched [Maximizing Opportunities for Scientific and Academic Independent Careers](#) (MOSAIC) program. Providing postdoctoral scholars with a cohort and access to professional development programming will hopefully aid in combatting imposter syndrome and feelings of isolation by creating community and developing job readiness for these diverse scholars. The National Institute of General Medical Sciences highlighted during the February 2021 Advisory Council [meeting](#) that the first round of MOSAIC K99 applicants was 75 percent female and 76 percent underrepresented minorities. FASEB looks forward to future cohorts of MOSAIC scholars and evaluation of program success both in job placement and establishment of professional networks by providing [social support](#).

Finally, efforts to enhance diversity such as MOSAIC and the [Faculty Institutional Recruitment for Sustainable Transformation](#) (FIRST) programs are exciting but must be viewed as only the beginning. Establishing the FIRST program [Coordination and Evaluation Center](#) is vital to assess challenges and achievements towards reaching the overarching goal of inclusive excellence at NIH-funded institutions. Understandably, the MOSAIC and FIRST programs are initially limited in size and treated as pilots. However, if these cohort models make meaningful impact it is crucial NIH continue to fund these and other initiatives. Small pilot programs--with less than twenty scholars each funding round--will be insufficient to move the needle on a national scale, and additional investments may be necessary.

Existing NIH policies, procedures, or practices that may perpetuate racial disparities/bias in application preparations/submissions, peer review, and funding, particularly for low resourced institutions, and proposed solutions to improve the NIH grant application process to consider diversity, inclusion, and equal opportunity to participate in research (e.g., access to application submission resources, changes to application submission instructions/guidance, interactions with and support from NIH staff during application process).

The “[Ginther gap](#)” was first noted almost a decade ago, and calls for [equity in funding](#) remain fervent to this day. NIH must act with all legally allowable authority possible to close the funding gap based on race and ethnicity. An achievable first step may be critically evaluating the peer review process. Implicit bias during peer review may be a negative component when assessing the applicant, and for trainee applicants may also create undesirable consequences when evaluating the sponsor(s). FASEB looks forward to results from the [anonymized review](#) of the Transformative Research Award to help understand if implicit bias is adversely affecting applicants from historically excluded backgrounds.

Best practices or proven approaches to build new or enhance existing partnerships and collaborations between investigators from research-intensive institutions and institutions that focus on under-resourced or underrepresented populations but have limited research resources.

NIH's [Support of Competitive Research \(SCORE\) Program](#) is fundamental to encourage participation from Minority Serving Institutions (MSIs) in competing for NIH awards. However, it was noted at the January 2020 National Institute of General Medical Sciences Advisory Council [meeting](#) that SCORE is too concentrated in only a few college and university systems, and the majority of SCORE applicants are not from historically excluded racial and ethnic backgrounds. The SCORE program shows promise, but widespread success requires broader uptake. To the extent possible, NIH may benefit from a larger applicant pool by offering frequent seminars or workshops to help institutions with applications for their first SCORE award.

Additional ideas for bold, innovative initiatives, processes or data-driven approaches that could advance the diversity, inclusion, and equity of the biomedical research workforce and/or promote research on health disparities.

FASEB is grateful for the engagement on this vital topic and for the bold declarations in the [Racism in Science](#) report. It is refreshing to see the agency directly acknowledge the challenges that lie ahead, particularly for Black and African American scholars. The NIH UNITE Initiative holds promise, and we look forward to further development and implementation. To aid in the Committees' ability to address needs of the extramural community additional stakeholder input may be required. Particularly on the "T" and "E" Committees, which focus on the extramural research ecosystem and transparency, inviting extramural stakeholders to be sitting members of the Committees may provide much needed perspective to the intramural groups.

Moving forward, it is vital that the NIH UNITE initiative collect data that may show uncomfortable outcomes; ultimately, disparities cannot be addressed if NIH is unaware of the extent of the matter. Furthermore, it is difficult to address the needs of both the intramural and extramural research communities without understanding their background and experiences.

FASEB appreciates and supports the initial focus on Black scientists and recognizes the need for efforts to expand to include all historically excluded groups to achieve the ultimate goal of an equitable research ecosystem. Downstream expansion of targeted efforts to include further diverse and historically excluded scholars is an exciting prospect. Steps can be taken to enrich data collection that put intersectionality and personal identities at the forefront. For instance, demographic categories in eRA Commons can be expanded to allow for more granular evaluation. For example, "Asian" is a broad category that when disaggregated almost certainly includes underrepresented minorities such as those in the research community of Hmong descent. Thus, while the whole of Asian individuals are well-represented in science, this may not tell the full story. Moving beyond race and ethnicity, data collection on "gender" should be inclusive of the breadth of possible identities including genderqueer and non-binary individuals. Although these are only two basic examples, there are many expansions to demographic data collection that will help illuminate underrepresented groups to target in future implementation of efforts to promote equity and diversity in science.