UNITE

2022 REQUEST FOR INFORMATION REPORT

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

National Institutes of Health

Turning Discovery Into Health

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Student-to-Workforce and Career Pathways

Barriers to training and lack of access to educational opportunities, persisting from early childhood through early career, were highlighted as significant challenges for groups underrepresented in science. Respondents noted that racial and ethnic minority students often do not have exposure to science, technology, engineering, and math (STEM) during K-12 education, which impacts overall career trajectories. These respondents provided recommendations on how NIH can best foster student engagement and interest in STEM from kindergarten through undergraduate years. Moreover, responses suggested that financing training and education is a key barrier for students from groups underrepresented in science who hope to pursue a career in biomedical research. Mentorship and strong academic networks were also noted as crucial to career success. However, respondents reported struggling to find strong mentorship, with some experiencing isolation and 'othering' within the predominantly White, male-dominated world of academia.

Biomedical Research Workforce

Respondents described how implicit and explicit biases affect hiring and promotion decisions within the NIH workforce and the broader biomedical research ecosystem. Respondents asserted that diversifying NIH leadership and hiring committees would bring more members of racial and ethnic minority groups into the workforce and into supervisory positions, ultimately helping the NIH workforce to be more representative of the U.S. population. Respondents acknowledged that overall diversification of NIH and the broader biomedical workforce will require prioritization and diversification of recruitment, hiring, promotion, and retention strategies that eliminate barriers faced by groups underrepresented in the workforce. Respondents also encouraged NIH to support career advancement by providing targeted mentoring, outreach, and training opportunities for racial and ethnic minority staff members.

Health Disparities and Health Equity Research

A lack of adequate funding prioritization within NIH and limited knowledge among reviewers about health disparities and health equity research methods were cited as key barriers to expanding and advancing health disparities and health equity research. Respondents urged NIH to prioritize these research areas across Institutes and Centers (ICs) and to increase resources and support for the National Institute on Minority Health and Health Disparities (NIMHD). Many comments discussed the need for cross-culturally appropriate, inclusive study designs. Comments also discussed data disaggregation and cohort studies to better understand the impact of research findings on underrepresented communities.

Community Partnerships and Outreach

Respondents commented on how meaningful partnerships with community organizations can eliminate or remove barriers that negatively impact groups underrepresented in the biomedical research workforce. Respondents highlighted that partnerships also support community-engaged research designed to address or reduce health disparities. While some respondents noted that current NIH efforts to build and enhance partnerships and outreach are well-designed, others highlighted that NIH could better incentivize researchers to incorporate community-based approaches. Respondents emphasized that community partnerships require trust and collaboration and that more can be done to enhance NIH-funded research by integrating community members at every stage of the grant process.

Distribution of Respondent Types

46%

Academic
(Includes 2% HBCUs)

13%

NIH Staff

11%

Health Professional

8%

Nonprofit/ Professional Society

SUMMARY OF COMMENTS BY TOPIC AREA

This report aims to summarize the responses to the RFI. As a result, some of the issues and recommendations raised may not be within NIH's purview as a Federal agency with a primary goal of funding biomedical research. Terminology within the report reflects respondents' language to the greatest extent possible to avoid inaccurate interpretation or overinterpretation of respondent comments. The summary tables are not an exhaustive list of all recommendations received, but rather the most commonly suggested. Specific respondent types are mentioned if their responses differed from or added additional perspective to the overall collective view.

GRANTS PROCESS

The _____

_____

not understand or value qualitative approaches, mixed methods, or community-based approaches. Identifying grant reviewers who are well-versed and have adequate expertise and perspective to evaluate health disparities and health equity research was suggested. A recommendation was made to diversify review panels by expanding the pool of potential reviewers beyond those who have received R01 or other substantial funding.

Respondents recommended that providing grant review training opportunities to early-career researchers, researchers from racial and ethnic minority groups, and researchers from lower-resourced institutions without significant funding would help prepare them for service on review panels, and ultimately improve panel diversity. Respondents advocated that study sections should reflect the diversity of the applicant pool, if not the general population. Proposed recommendations included allowing investigators to self-nominate for consideration on review panels and limiting terms of service for study section members to allow for higher turnover. This term limit would increase the opportunities to include a greater diversity of reviewers and perspectives.

"The composition of study sections being comprised only of people who have been awarded NIH grants is important because these people understand the grant application and review process best. However, this becomes a systemic problem when the vast majority of investigators funded by NIH (in some fields more than others) are of the majority (i.e., White males). It is not too difficult to see that if there is a panel comprised mostly of White males who were mentored by White males, if they review applications produced by other White males who had similar training then these reviewers may view these applications more favorably."

Respondents suggested that reviewers are influenced by implicit biases, including affinity bias, in which individuals demonstrate an unconscious tendency to prefer others similar to themselves. This bias can lead reviewers to give better scores to investigators with demographics and areas of expertise similar to their own. There were suggestions that NIH should enhance fairness in the grant review process through education and monitoring. One recommendation was to provide education and training in implicit bias and other aspects of DEI for those participating in the grant review process, including grant reviewers and Scientific Review Officers. Another recurring recommendation was regular evaluation of grant reviewers and summary statements for quality and biases.

"[NIH should require] evidence-based training in DEI and implicit bias for all peer reviewers, study section chairs, and NIH staff involved in grant review. Efforts should be made to measure the effectiveness of bias training once implemented."

Funding Priorities and Selection of Grants

Respondents called on NIH to diversify the extramural research workforce through grant funding procedures. Several factors were identified as current barriers to funding, including the use of paylines and select pay procedures by NIH. Paylines are Institute or Center (IC)-specific funding cutoff points for grant applications, and select pay is used to fund outside of these cutoff points to ensure balance across the pool of grants and expand the breadth of topics and approaches to funded research. A perceived lack of transparency surrounding select pay processes and the research priorities of individual ICs may also contribute to funding gaps. Moreover, IC funding policies and funding priorities were perceived as major contributors to the lack of funding diversity. The responses stated that the select pay process is biased, particularly regarding how POs

choose applications to recommend for select pay. Repeated funding to support the same investigators and research institutions was also an identified issue. Some responses cited Taffe and Gilpin's article highlighting racial disparities in NIH funding, which suggested that meritorious grant applications from Black PIs that score above the payline have a lower likelihood of receiving funding compared to similarly scored applications from White PIs.[8]

Recommendations to mitigate and reduce funding gaps for researchers from groups underrepresented in science included increasing transparency and standardizing the select pay process across NIH. Another recommendation included expanding paylines, akin to the approach taken with early-stage investigators, and providing select pay for meritorious applications from racial and ethnic minority groups and for health disparities and health equity research. Respondents also suggested instituting random selection lotteries for meritorious applications and implementing grant caps for highly funded investigators and institutions to free up funding for others.

STUDENT-TO-WORKFORCE AND CAREER PATHWAYS

Respondents asserted that access to education and exposure to research training is critical for groups underrepresented in science, from early childhood through early career. Diversification of the biomedical research workforce requires identifying and bridging gaps in the student-to-workforce pathway,[11] which is defined as the path students take to explore, identify, and pursue a career in biomedicine. Research and policy work in this area frequently attempt to address "leaky" student-to-workforce pathway issues wherein students leave the pathway by choosing majors or career paths outside of science, technology, engineering, and math (STEM). Students from underrepresented racial and ethnic groups, particularly those from low-income backgrounds with limited financial support, often do not have exposure to STEM early in life and face significant financial and educational barriers in pursuit of research careers.[11] Respondents discussed the leaky student-to-workforce pathway and the significant challenges students, trainees, individuals underrepresented in science, and early-career researchers face that slow or halt progress and potentially lead to long-term retention issues within the biomedical research workforce. For this report, the biomedical research workforce refers to the collective of individuals who comprise the internal NIH research workforce and the extramural biomedical research workforce.

A summation of respondents' recommendations for strengthening the student-to-workforce pathway and addressing issues related to career pathways in the biomedical research field is detailed in Table 3.

Table 3: Summary of Recommendations for Student-to-Workforce and Career Pathways

Topic	Recommendations
Pre-Graduate Curricula and Exposure to STEM	• Develop and fund improved pre-graduate STEM education aimed at diverse groups of scholars • Increase outreach to pre-graduate students by members of the biomedical research community • Support diversity bridge programs and opportunities to engage in research
Financing Undergraduate and Graduate Training	• Address disparities in student loans and repayment programs • Support graduate students through fast-track programs and connections to post-doctoral positions • Increase funding to current NIH training programs that support diverse trainees
Research Training	• Invest in research infrastructure to support training programs at lower-resourced institutions •

Pre-Graduate Curricula and Exposure to STEM

Respondents encouraged creation of funding opportunities that support pre-graduate students in STEM education and/or focus on diversifying the biomedical research student-to-workforce pathway, as early exposure to STEM is critical in fostering interest in STEM topics and encouraging more students to pursue STEM careers. Several recommendations included suggestions for both extramural and NIH intramural researchers to increase outreach to pre-graduate students. There were also suggestions for improved support for programs that allow pre-graduate, racial and ethnic minority students to engage in research and participate in NIH activities (e.g., research camps or summer programs). Expanded partnerships between government agencies, community colleges, minority serving institutions (MSIs), and lower-resourced institutions were suggested to improve students' exposure to scientific opportunities. The NIH Science Education Partnership Awards (SEPA)[12] was listed as one example of an effective partnership program that supports researchers and K-12 schools.

"The Science Education Partnership Awards (SEPA), which create partnerships between researchers and K-12 schools, is an example of an effective partnership that often reaches teachers and students who are underrepresented in biomedical research. As a grantee for 30 years, [I have] seen the benefits of this program in practice, bringing teachers from across the country into the laboratories of working scientists where they had the opportunity to gain first-hand experience working on a research project."

Financing Undergraduate and Graduate Training

As students enter their undergraduate years and aspire to graduate-level STEM education, a primary concern cited was the difficulty of financing education in the U.S. and the long-term burden of student loan repayment. Respondents commented that removing financial barriers associated with expensive and lengthy degree pursuits will allow more individuals from underrepresented racial and ethnic communities to enter and sustain scientific careers without taking on a lifetime of financial burden. Respondents specifically highlighted how students from low-income families face financial difficulties pursuing science degrees. Rising student loan rates contribute to wealth inequity,[13] contributing to a lack of diversity within the field. Many respondents, therefore, suggested the U.S. government pay down student debt and address disparities in student loans and student loan repayment opportunities. While NIH may have limited ability to relieve the burden of student loans, respondents encouraged NIH to consider additional financial support for students, trainees, and early-career researchers.

"[T]he prospect of remaining financially unviable for 8 years after undergraduate heavily favors those able to take financial risk, persons with significant familial or spousal wealth, persons without dependents or persons with limited debt or financial obligations to family in-country or abroad. This is not a recipe for diversity and cannot be maintained in academia."

Additionally, respondents called on NIH to expand funding opportunities to a broader pool of investigators by expanding programs that support early-career researchers and to make training and career development mechanisms more easily accessible to trainees without extensive publications, presentations, or previous funding history. Respondents recommended devoting additional funds to existing initiatives and/

to training opportunities or allow trainees to streamline or reduce total time spent in training were highlighted. These programs would enable trainees to enter their chosen fields earlier and receive greater financial support earlier in their careers.

Several types of programs at NIH and academic institutions were frequently cited as beneficial, including those that connect trainees to peers at other research training programs; those that provide opportunities for collaboration; those that provide hands-on experience; and those that provide mentorship experiences. The NIH Distinguished Scholars program[14]

Barriers to Career Development

As highlighted by respondents, many students and trainees face significant financial barriers at the beginning of their careers. Unfortunately, the low salaries and lack of tangible benefits (e.g., affordable insurance, childcare, and housing) associated with biomedical research training may exacerbate this problem. Those who continue in biomedical research careers may face additional challenges that affect career advancement, including a

Valuation of Academic and Scientific Service

Many respondents reported that contributions to the research community, such as mentoring and community outreach, which do not support individual research programs, are significantly undervalued. Further, staff from underrepresented racial and ethnic groups are frequently encouraged or tasked to participate in and lead DEI-related activities, a phenomenon referred to as the "minority tax." These individuals are also often in high demand as mentors to support students from similar racial and ethnic backgrounds. These activities may take them away from research and academic responsibilities without significant acknowledgment from supervisors or institutional leadership, thus impeding career advancement. Respondents emphasized that staff from underrepresented racial and ethnic groups should not be obligated or expected to carry the burden of culture change. However, mentorship and participating in DEI-related activities should be adequately valued. Recommendations to address these challenges included creating protected time for academic and scientific service and directly rewarding these contributions when considering promotions, tenure decisions, and grant applications.

"Service requests are often much higher for faculty of color than for faculty from the majority culture. These requests often involve serving on search committees and other institutional committees to address diversity requirements and being [asked] to provide pr expettions to ador commi17 8g on searcpane.5 aculnts fr)18pporeuesoloriode.5 orti cften ir thanse requests oftenack commiss u partithem cant acknofor afr18 (eh comm, putedandng,t appl w20.dng,tetc. It wbe adeq)]TJ T[(

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"One cannot separate mentorship from science. We cannot excuse people who are perceived 'brilliant,' yet treat the trainees in their laboratories as dispensable labor. A careful evaluation by institutions of their faculty's mentorship, not based on number of trainees and number who attain faculty positions, but rather peer-and trainee-evaluations, as is often done in liberal arts setting, will hopefully substantiate this as a review criterion for promotion. We likely know of many mentors, and are likely the product of some of them, who create special environments where scientists can thrive in a positive and rewarding environment. We need to 'quantify' this in some way in order to proactively reward these environments. They will lead to happier trainees regardless of the type of scientific career they go on to pursue."

Academic Networks and Networking Opportunities

Despite the importance of building academic networks, many students and trainees report challenges and limited networking opportunities. These challenges can be exacerbated when students and trainees attend smaller schools or MSIs, or do not work with highly prestigious or well-published mentors. Some described experiencing unfriendly and even hostile academic networks, which were seen as a contributor to student-to-workforce pathway barriers. Responses indicated continued implicit and explicit bias toward individuals from racial and ethnic minority groups and individuals underrepresented in science, both within NIH and the extramural research workforce. Reported racist comments, microaggressions, and "othering" create environments in which individuals from racial and ethnic minority groups feel unwelcome and face numerous obstacles to success. These experiences can lead students and researchers to leave the biomedical research workforce earlier and at higher rates. Respondents encouraged NIH to expand networking and collaboration opportunities for trainees and early-career researchers.

"Continued feelings of tokenism, alienation, and a lack of support persist…. Peer networks are often found to be unwelcoming, which can prevent development of crucial relationships that lead to collaboration and advancement."

Some respondents suggested that NIH host more scientific forums to provide networking opportunities. Respondents also recommended that NIH take a more direct approach and expand visiting scholars, exchange, or shadowing programs that foster collaboration. Other recommendations included mitigating the financial and geographic barriers to researchers interacting with the larger research community through free or low-cost NIH-sponsored events that utilize virtual platforms and other technologies designed to promote networking and collaborations.

BIOMEDICAL RESEARCH WORKFORCE

As noted by respondents, supporting DEI across the biomedical workforce requires participation from individuals and institutions at every level. For this report, the biomedical research workforce refers to the collective of individuals who comprise the internal NIH research workforce (primarily intramural researchers) and the extramural biomedical research workforce (NIH-funded researchers and trainees). Appendix 1 further delineates these categories. The internal NIH workforce includes both research and non-research staff. Respondents commented about DEI issues within the biomedical research workforce, including recruitment, hiring, promotion, and retention within biomedical research and the importance of diversity in leadership and hiring committees. Responses were categorized to indicate whether they were related to the NIH internal workforce, extramural research workforce, or the entire biomedical research workforce.

A summation of respondents' recommendations related to the biomedical research workforce is detailed in Table 4.

Table 4: Summary of Recommendations for Biomedical Research Workforce

Topic	Recommendations
Recruitment, Hiring, Promotion, and Retention	• Advance researchers from underrepresented groups across all scientific career stages at NIH through improved recruitment, hiring, promotion, and retention practices • Diversify NIH staff to be more representative of the U.S. population • Provide more outreach and assistance with the NIH job application and submission process • Review the USAJOBS process to reduce bias and improve equity • Encourage or require the extramural research community to diversify staff and build a more diverse student-to-workforce pathway • Rethink and reimagine the range of staff across skillsets, degrees, and backgrounds that can positively contribute to biomedical research • Make training more accessible to a wide range of educational degrees and levels • Work with research institutions to support long-term mentoring

Recruitment, Hiring, Promotion, and Retention

In general, responses indicated the perception that NIH is committed to cultivating a diverse internal workforce and is leading the biomedical research workforce overall toward greater equity and representation. Some respondents viewed NIH positively for its long-term and growing efforts to support diversity across the biomedical research community, with some applauding the UNITE initiative as an example of this commitment. However, other respondents criticized NIH's lack of progress toward actionable solutions to its stated DEI goals. They recommended NIH implement, evaluate, and report on appropriate initiatives and policy changes that could help eradicate DEI issues in the biomedical research workforce.

Internal NIH Workforce

> ***"These gate keeping processes are locking people like me out of NIH and pretty much ensuring that my career will fail."***

Respondents called on NIH to ensure that its internal workforce is representative of the demographics of the U.S. population and asked NIH to serve as a role model for the extramural research community in this commitment. Responses from NIH staff and those within academia described the NIH recruitment and hiring processes as barriers to employment at NIH for job seekers from groups underrepresented in the workforce. Respondents expressed concern that beginning with USAJOBS,[20] the Federal Government's official employment site that connects job seekers with Federal employment opportunities, applicants from groups underrepresented in the workforce are often disadvantaged due to challenges in meeting certifications and developing a resume that leads to an official offer from NIH.

Respondents encouraged expanding outreach via in-person and virtual workshops and job fairs for sharing information on the NIH job application and submission processes. Moreover, suggestions indicated that these efforts would be particularly beneficial for individuals from groups underrepresented in the workforce and those training or employed at MSIs. Though outside NIH's purview, respondents suggested an overall review of the USAJOBS process to ensure that all applicants receive fair and unbiased chances to work within the Federal Government.

Respondents also reported a lack of career advancement opportunities for some members of the internal NIH workforce. For example, respondents observed a lack of successful transitions between NIH post-doctoral trainees and full-time NIH positions, particularly for members of groups underrepresented in science.

Extramural Biomedical Research Workforce

Several concerns about the extramural biomedical research workforce were noted, including overall lack of diversity within the workforce and persistent barriers to success for members of groups underrepresented in science. Comments addressed the unique challenges of researchers at lower-resourced institutions and described the pressure felt by researchers from racial and ethnic minority populations. Respondents from academic research settings indicated that academia still feels like an "old boys club" due to a lack of diversity, encompassing race, ethnicity, gender, and other demographic characteristics. There was a perception that success is determined by how well one is connected. Although there have been efforts to diversify graduate and post-doctoral pools, respondents reported comparatively fewer resources to support individuals from underrepresented racial and ethnic groups in obtaining faculty and leadership positions in the extramural research workforce.

Common suggestions were for NIH to prioritize and build a more diverse student-to-workforce pathway and encourage and/or require, where possible, the diversification of the extramural research workforce. One specific suggestion was for NIH to support researchers from racial and ethnic minority groups by working with academic research institutions to improve their hiring practices and long-term mentoring. Moreover, lower-resourced MSIs

The extramural biomedical research community was encouraged to rethink and reimagine the range of staff that can positively contribute to biomedical research. Specific suggestions were made to expand and diversify the biomedical research community by welcoming inter-

HEALTH DISPARITIES AND HEALTH EQUITY RESEARCH

As identified by respondents, research on health disparities and health equity offers pathways to ensure all communities can obtain equitable health outcomes and can access necessary health care resources. Respondents reported that health disparities research was less valued or supported by NIH, which respondents stated contributes to inequities in funding and lack of diversity in the workforce.

A summation of respondents' recommendations related to health disparities and health equity research is detailed in Table 5.

Table 5: Summary of Recommendations for Health Disparities and Health Equity Research

Topic	Recommendations
Prioritization and Support of Health Disparities and Health Equity Research	• Improve prioritization and funding of health disparities and health equity research • Increase resources and funding for NIMHD • Ensure all NIH ICs support health disparities and health equity research • Emphasize the value of qualitative, mixed methods, social science, translational, community-based, community-engaged, and multi-disciplinary research models • Support culturally sensitive and inclusive study designs • Prioritize research on underrepresented populations and consider data disaggregation techniques and/or cohort studies that would examine the needs of individuals from underrepresented groups • Increase funding opportunities that address the health effects of bias, racism, and xenophobia • Focus on disease areas with significant disparities across underserved communities

Prioritization and Support of Health Disparities and Health Equity Research

Respondents urged NIH to prioritize health disparities and health equity research to better understand the health needs of populations that experience health disparities. Many respondents also emphasized the importance of adequate funding for this research, noting that a failure to support health disparities and health equity research will lead to limited advancements and inadequate strategies to improve health disparities and outcomes. Respondents, predominantly those from academia, perceived that the devaluing of health disparities and health equity research is partially due to biases in the grant review process that impact funding opportunities. There were calls for NIH to expand resources for NIMHD that will enable the Institute to increase funding for extramural research and staffing. Respon-

"Collaboration of NIH institutes with NIMHD on addressing health disparities/inequities needs to be heightened to increase the funding of studies on health inequities throughout NIH. While this has increased in the last few years, this has to be taken to a greater scale to result in meaningful advancement of our understanding of health."

dents also emphasized the need for all NIH ICs to increase funding and prioritize health disparities and health equity research. Respondents stressed that this research is crucial across ICs and should not be the sole purview of NIMHD.

Comments highlighted how specific groups—including women; Asian Americans, Native Hawaiians, and Pacific Islanders (AANHPI); individuals from Tribal communities; members of sexual and gender minority groups (SGM); and members of the disabled community—remain largely overlooked, even in considering recent health disparities and health equity research. Responses encouraged disaggregation of data within these groups, use of cohort studies to examine the needs of subgroups, and more consideration of intersectionality. Respondents also proposed specific funding opportunities that would address health care needs in these communities, as well as continued research investment on the health effects of bias, racism, and xenophobia.

Respondents noted that there are many researchers from groups underrepresented in science interested in studying health disparities and health equity, yet respondents assert there are biases that prevent certain types of research from receiving NIH funding. Respondents suggested NIH emphasize the value of qualitative, mixed methods, social science, translational, community-based, and multi-disciplinary research models. They perceived these research approaches as valuable for assessing the magnitude and nuances of health disparities. Respondents also highlighted the importance of culturally sensitive and inclusive study designs, which are essential for understanding population interests and recruiting diverse patient populations.

COMMUNITY PARTNERSHIPS AND OUTREACH

Complementary to the responses discussed above, respondents noted that NIH should support and encourage community-engaged research to address health disparities and health equity. Respondents identified that when a specific underserved community or population is the focus of a research study, guidance from community members in the development of study design and execution can ensure the methods and interventions appropriately reflect the needs of communities.

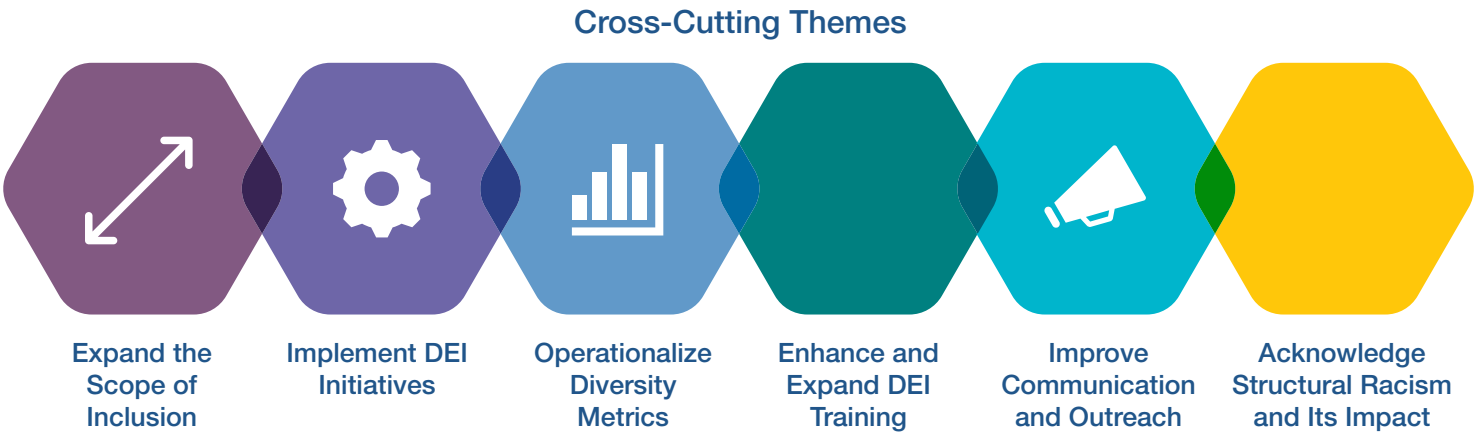
Many responses emphasized the value of developing relationships with community-based organizations and community members. Some comments highlighted organizations in specific communities (e.g., Tribal communities) and others referred to organizations more broadly (e.g., local health organizations). NIH was encouraged to improve community outreach to build or strengthen partnerships with community groups. Respondents noted that community partnerships involve biomedical researchers and community members working together toward common goals, with each partner bringing resources and strengths, resulting in stronger research studies and more relevant health outcome measures.

A summation of respondents' recommendations for improved community partnerships and outreach is detailed in Table 6.

Table 6: Summary of Recommendations for Community Partnerships and Outreach

CROSS-CUTTING THEMES

A collection of concepts emerged throughout responses that were not unique to any one RFI topic area, respondent type, or response focus. These areas were identified from respondents' comments as cross-cutting themes that span all aspects of DEI planning at NIH and the biomedical research workforce. Collectively, these cross-cutting themes may help to inform actions in support of DEI across the biomedical research workforce.



EXPAND THE SCOPE OF INCLUSION

There were requests to expand NIH's definition of DEI. Often, responses suggested NIH has ignored groups that may be viewed as "less" marginalized. Respondents encouraged NIH to expand its focus to consider factors beyond race and ethnicity and include attention to demographic factors such as SGM status, age, geography, and disability status. These respondents frequently highlighted inclusion and accessibility concerns for many underrepresented populations and brought attention to how intersectionality may further impact opportunities for members of racial and ethnic minority groups.

Some responses also highlighted the fact that the NIH definition for underrepresented scientists does not include Asian Americans; however, respondents noted that individuals from Asian American subgroups (e.g., Hmong, Vietnamese, Filipino, Laotian, Cambodian Americans) are vastly underrepresented in STEM fields. Respondents stated their perception that some diversity-oriented NIH training opportunities are inaccessible to Asian American researchers.

Respondents also noted that grouping diverse communities into single categories does not appropriately account for the heterogeneity within communities and may inadvertently mask the challenges experienced by individuals. For example, subgroups within the AANHPI population show evidence of significant health disparities in areas of diabetes, cancer, and mental and behavioral health disorders.[14] However, these disparities are often difficult to assess when data is presented for the entire AANHPI population without examining differences across subgroups. Some respondents called for the disaggregation of racial and ethnic data when reporting NIH internal and biomedical research workforce data, as well as when reporting data on the demographics of participants in NIH-funded research, particularly when considering AANHPI, Hispanic/Latino, and Middle Eastern and North African populations.

"While this RFI and the response here is primarily focused on racial equity, we note the importance of intersectionality in properly addressing structural racism and discrimination and hope the agency will consider in its work all groups facing inequities in the biomedical research workforce, including racial and ethnic minorities, women, persons with disabilities, LGBTQ individuals, and first-generation college students as well as other individuals from diverse backgrounds."

IMPLEMENT DEI INITIATIVES

There were concerns that NIH's focus on structural racism, as represented in this RFI, would not be followed by significant, tangible action or implementation. Although some respondents indicated positive perceptions of NIH's recent acknowledgment of structural racism, many stated that further action is needed. Responses indicated that although NIH has had longstanding awareness of the lack of diversity in funded research and the biomedical research workforce, NIH could do more to implement concrete actions aimed at eliminating bias and advancing DEI. Moreover, some respondents stated they could not identify any DEI programming or initiatives at NIH, while others noted they could not identify examples of successful programs. They called on NIH to implement actionable solutions and continuously report on the progress of DEI initiatives.

ENHANCE AND EXPAND DEI TRAINING

Improvements to DEI training, mandating training for specific groups, and increasing training volume and frequency, both at NIH and across the biomedical research workforce, were frequently suggested. Implementing mandatory training was recommended for grant reviewers, internal NIH staff, PIs supported by NIH grants, academic and research mentors, early-stage investigators, trainees, and fellows. Respondents frequently encouraged NIH to transition beyond simple implicit bias training to a more comprehensive evidence-based training.

IMPROVE COMMUNICATION AND OUTREACH

Improved communication was highlighted as a fundamental way to enhance NIH institutional partnerships, community engagement, the grant application process, and relationships with current or potential NIH trainees and staff. Many submissions called for NIH to increase and improve internal and external communication to support DEI. Respondents drew particular attention to the need for better communication with underrepresented communities and lower-resourced institutions. A few suggested communication priorities included simplifying NIH communication to avoid language barriers; expanding targeted outreach to administrative support staff and investigators at MSIs and lower-resourced institutions; and improving outreach to students, trainees, and early-career researchers from groups underrepresented in science. Some requested outreach formats included hosted discussions, listening sessions, seminars, and trainings and workshops.

"Communication will be key to the success of these efforts and visuals/words must be weighed carefully.... If there is an end goal for these current efforts... then I suggest that should be conveyed clearly and with assurances [that UNITE] is not a one and done."

ACKNOWLEDGE STRUCTURAL RACISM AND ITS IMPACT

While most RFI respondents agreed with the hypothesis that structural racism presents obstacles for members of racial and ethnic minority groups in the biomedical research workforce, some denied the existence of structural racism. There was disagreement regarding the existence or implications of structural racism in the biomedical workforce amongst respondents. Some indicated that they did not feel there was a lack of diversity or evidence of structural racism at NIH or in the biomedical workforce, while some respondents described their perception of what they referred to as "reverse discrimination." These subsets of respondents often expressed that career advancement and grant funding decisions should be strictly merit-based and without regard to diversity, equity, or inclusion considerations. These comments highlighted a belief that science is strongest when it is purely merit-based.

DISCUSSION

Analysis of responses suggested significant interest in the above-discussed topics on behalf of many types of respondents. Forty-six percent of responses came from members of academia, including 2% from HBCUs, although respondents spanned a variety of categories, including NIH staff, health professionals, and non-profit and/or professional societies. Most respondents indicated agreement with the ideas put forward in the RFI, i.e., that NIH carries a significant responsibility to address the systemic challenges and barriers affecting the NIH workforce and NIH-supported biomedical research community and that enhancing workforce diversity and equity across the biomedical enterprise are critical steps to achieving progress in these areas. However, a portion of respondents did not perceive or denied concerns related to structural racism or other forms of bias, inequitable treatment, or discrimination within NIH or the greater biomedical workforce.

Overall perceptions of NIH's attempts to address structural racism and inequities prior to the release of the RFI were mixed. Many respondents described NIH as supportive of workforce diversity but noted a lack of implementation and little tangible evidence of change. Many respondents described their perceptions of NIH as a predominantly White, male organization, especially at the leadership and senior levels. This perceived lack of diversity was also extended to the larger biomedical workforce.

Responses and recommendations for NIH spanned a broad array of topics. The grant process was most frequently cited by respondents, who asserted that review policies and lack of diversity on review panels are some of the most significant contributors to racial and ethnic funding gaps among extramural researchers. Relatedly, many respondents indicated that health disparities and health equity research is not adequately or equitably prioritized across all NIH ICs. Many comments noted grant reviewers often are not well trained to consider research designs and methodologies frequently used in health disparities research, including community-appropriate approaches, qualitative designs, and projects that focus on social or structural determinants of health, which further perpetuates lack of funding for health disparities research.

Training and mentorship; hiring, promotion, and retention; and community outreach and engagement were also areas of frequent focus. Respondents highlighted specific concerns across these topics and provided recommendations for NIH to address these challenges. Some recommendations were outside NIH's purview. Other recommendations were appropriate for NIH to consider and could also be applied by other employers, organizations, or partners across the biomedical workforce. Many respondents called upon NIH to lead by example to build trust in the biomedical community. They called for NIH to do this via increased outreach, engagement, and communications surrounding structural racism, diversity, equity, and inclusion.

Responses to this RFI highlighted the need to assess biases and barriers to DEI in policies, practices, and procedures at NIH and external research institutions. This RFI represents one of the earliest efforts of the NIH UNITE initiative and one of the broadest attempts to gather input on this important topic from NIH partners, collaborators, and the public. NIH appreciates the exceptional number of detailed, thoughtful responses from respondents who represent many facets of the biomedical workforce and broader community. Practical recommendations shared by respondents, summarized in this report, will assist NIH in identifying, developing, and implementing strategies that will allow the biomedical enterprise to benefit from a more diverse and inclusive research workforce and a more robust portfolio of research to better understand and address inequities in our existing system.

APPENDIX 1: GLOSSARY

All definitions marked with † are from the NIH Glossary.[21] Definitions marked with * are defined within this report.

Term	Definition/Description
Accessibility	The design, construction, development, and maintenance of facilities, information and communication technology, programs, and services so that all people, including people with disabilities, can fully and independently use them. Accessibility includes the provision of accommodations and modifications to ensure equal access to employment and participation in activities for people with disabilities; the reduction or elimination of physical and attitudinal barriers to equitable opportunities; a commitment to ensuring that people with disabilities

Term	Definition/Description
Diversity	The practice of including the many communities, identities, races, ethnicities, backgrounds, abilities, cultures, and beliefs of the American people.[6]
Early-career researchers	Individuals in the early stages of their career, including pre-doctoral researchers through early-stage investigators.*
Early-stage investigators	Program Director / Principal Investigator (PD/PI) who has completed their terminal research degree or is at the end of post-graduate clinical training within the past 10 years, whichever date is later, and has not previously competed successfully as PD/PI for a substantial NIH independent research award.†
Equity	The consistent and systematic fair, just, and impartial treatment of all individuals, including individuals who belong to underserved communities that have historically been denied such treatment.[6]
Extramural research workforce	Researchers external to NIH for whom NIH provides funding support.*
Grant review criteria (scored)	Impact scores are based on grant reviewers' assessment of 1) significance, 2) investigator(s), 3) innovation, 4) approach, and 5) environment.[9]
Grants process	Steps required for an application to proceed from planning and submission through to award.[26]
Groups underrepresented in science	Individuals from racial and ethnic groups that have been shown by the National Science Foundation to be underrepresented in health-related sciences on a thrd. thrd.

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Term	Definition/Description
Minority serving institution (MSI)	Institutions of higher education that serve minority populations, and strive to give their constituents the social and educational skills needed to overcome racial discrimination and limited economic opportunities.[32]
Minority tax	Extra, financially uncompensated duties and responsibilities that minorities are asked to perform to increase diversity at their institutions, such as serving on a search committee that would otherwise be all White.[33]
Nepotism	Inappropriate action related to the appointment, employment, promotion, or advancement of a relative, recommending that a relative receive an award, or the advocacy of such actions for the benefit of a relative.[34]
NIH non-research workforce	NIH staff (e.g., administration, human resources, budget, facilities, and logistics) across the enterprise in non-research roles.*
Othering	The construction and identification of the self or in-group and the other or out-group in mutual, unequal opposition by attributing relative inferiority and/or radical alienness to the other/out-group.[35]
Outreach	Sending/receiving information or news, including targeted communication with certain groups or institutions.*
Payline	A percentile-based funding cutoff point determined by balancing the projected number of applications coming to an NIH Institute with the amount of funds available. Set after the budget is determined, paylines are not mandatory, are not made for all activity codes, and may be adjusted during the year.†
Pre-graduate student	An individual receiving education in the grades Kindergarten through twelfth grade, or undergraduate education.*
Principal Investigator (PI)	An individual 43signated i /P ⁄La ge-g, including[aoted)20 or7ci 0 who ar askedleeerence gmine2 tinves31.446PI)*eac[0 1 TH Institut0.995 3.182 Td[An askedleer/oenhroipiedualmmuniceducilH Institute witority codesTa (employmer *35 *

Term	Definition/Description
R2 universities	Institutions that meet benchmarks across 10 indicators measured by the Carnegie Classification of Institutions of Higher Education indicating that the university engages in "high research activity."[36]
Racial and ethnic minorities	NIH uses the racial and ethnic group classifications determined by OMB in the Revisions to Directive 15, titled Standards for Maintaining, Collecting, and Presenting Federal Data on Race and Ethnicity. The minority racial and ethnic groups defined by OMB are American Indian or Alaska Native, Asian, Black or African American, and Native Hawaiian or other Pacific Islander. The ethnicity used is Latino or Hispanic.[27]
Racial equity	A process of eliminating racial disparities and improving outcomes for everyone. It is the intentional and continual practice of changing policies, practices, systems, and structures by prioritizing measurable change in the lives of people of color.[37]
Research infrastructure	The resources and services for conducting research, including major equipment or sets of instruments, knowledge-related facilities such as collections, archives or scientific data infrastructures.*
Research project grant (R01)	Provides support for health-related research and development based on the mission of NIH, R01s can be investigator-initiated or can be solicited via a Request for Applications. The R01 research plan proposed by the applicant must be related to the stated program interests of one or more of the NIH Institutes and Centers based on their missions.[38]
Scientific Review Officer (SRO)	NIH official who serves as the designated Federal official and has legal responsibility for managing the peer-review meeting, the procedures for evaluating the applications assigned to the scientific review group, and the determinations and management of conflicts of interest, as noted in 42 CFR 52(h).†
Select pay	The funding of a small number of programmatically important applications at the margin of the payline as recommended by Council.†
Student-to-workforce pathway	The path students take to explore, identify, and pursue a career in biomedical research.*
Summary statement	A combination of the reviewers' written comments and the SRO's summary of the members' discussion during the study section meeting. It includes the recommendations of the study section, a recommended budget, and administrative notes of special considerations.†
Trainees	Pre-doctoral and post-doctoral researchers training in biomedical research.*

Term	Definition/Description
Undergraduate student	An individual seeking one of two higher education degrees—an associate degree or a bachelor's degree.[39]
Underrepresented group	Group of individuals underrepresented in the biomedical, clinical, behavioral, and social sciences, such as people with disabilities, people from disadvantaged backgrounds, and certain racial and ethnic groups such as Blacks or African

APPENDIX 2: SUMMARY OF RECOMMENDATIONS

Topic: Student-to-Workforce and Career Pathways	Recommendations
Pre-graduate Curricula and Exposure to STEM	• Develop and fund improved pre-graduate STEM education aimed at diverse groups of scholars • Increase outreach to pre-graduate students by members of the biomedical research community • Support diversity bridge programs and opportunities to engage in research
Financing Undergraduate and Graduate Training	• Address disparities in student loans and repayment programs • Support graduate students through fast-track programs and connections to post-doctoral positions • Increase funding to current NIH training programs that support diverse trainees

Topic: Student-to-Workforce and Career Pathways	Recommendations
Mentorship and Academic Networks	• Support mentorship initiatives for the internal NIH and extramural research workforce • Add mentoring requirements to grant criteria • Incentivize institutions and faculty to support and expand mentorship programs • Create partnerships between lower-resourced and high-resourced institutions for mentoring and collaborations • Maintain and add funds to effective mentoring programs • Improve training, evaluation, and oversight for mentors • Offer recognition and reward to strong mentors • Expand networking and collaboration opportunities for trainees and early-career researchers

Topic: Health Disparities and Health Equity Research	Recommendations
Prioritization and Support of Health Disparities and Health Equity Research	• Improve prioritization and funding of health disparities and health equity research • Increase resources and funding for NIMHD • Ensure all NIH ICs support health disparities and health equity research • Emphasize the value of qualitative, mixed methods, social science, translational, community-based, community-engaged, and multi-disciplinary research models • Support culturally sensitive and inclusive study designs • Prioritize research on underrepresented populations and consider data disaggregation techniques and/or cohort studies that would examine the needs of individuals from underrepresented groups • Increase funding opportunities that address the health effects of bias, racism, and xenophobia • Focus on disease areas with significant disparities across underserved communities

Topic: Community Partnerships and Outreach	Recommendations
Building Community Partnerships	• Build community partnerships to encourage community participation in the development of programs and initiatives, understanding of, and participation in NIH research studies • Require or incentivize applicants to incorporate community-based approaches into their research • Invite community members to serve as investigators, participate in the grant review process, and serve as an intermediary between investigators and study participants • Build partnerships upon trust and in a collaborative manner

APPENDIX 3: TABLE OF ABBREVIATIONS

Abbreviation	
AANHPI	Asian American, Native Hawaiian, and Pacific Islander
BIPOC	Black, Indigenous and People of Color
DEI	Diversity, Equity, and Inclusion
DEIA	Diversity, Equity, Inclusion, and Accessibility
EO	Executive Order
FOA	Funding Opportunity Announcement
GREAT	

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*RFI responses are available upon request via email to UNITEInitiative@nih.gov