RESPONSE TO *Request for Information: 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*.
Link to RFI: https://grants.nih.gov/grants/guide/notice-files/NOT-OD-21-066.html

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The NIH seeks comments on any or all of, but not limited to, the following topics:

<u>All Aspects of the Biomedical Workforce</u>

- *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.*

    - Gender and racial inequity is well documented in funding portfolios across NIH (references and summaries below). Despite the existence of programs designed to incentivize and promote early career development, there is often poor retention at later career stages. Grant review processes are one venue where changes could make a difference. Specifically relevant is the fact that there often exists gender or racial bias when the applicant names or institutions for a grant application are known. One could consider multiple strategies to overcome this bias:
        - First, a two stage application process for funding applications could be created. The first stage would be double-blind. Once a proposal has been selected from this pool, an unblinded review process could be performed to ensure that the funded applicants met diversity metrics goals, as well as providing additional support to any candidate who may not have easy access to institutional resources or other specific programmatic needs.
        - A second strategy could entail improved and more creative efforts to increase diversity in the grant review process, thereby improving representation in panels,

in NIH-planned workshops, etc. While efforts to realize gender parity may be working to effectively achieve it in some cases, there are still cases in which the "peer" portion of the review is failing as it concerns career experience, trajectory, skills, and other demographic attributes.

- The NIH has an excellent source of focus on gender equity in the Office of Research in Women's Health. However, throughout the NIH, there should be greater focus on ensuring gender equity. For example, there should be a greater focus on ensuring that study sections have enough women and people of color in them, so that the chance of bias is reduced significantly.

- *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.*

    - Ensure that grants and proposals include scientists from underrepresented institutions with equivalent funding. Inclusiveness is not just about adding a single representative of a minority; instead, it should include minority institutions and communities. Many programs and organizations believe that one minority face, one name, are sufficient to satisfy *a* checkbox. The real systemic change will take place when there are equal partnerships and collaborations with underrepresented organizations and institutions, and when these institutions are placed as decision makers about science, training, and funding. Partnerships should go beyond the same couple of faces people know from the few well funded academic institutions. It takes risks and failure, then success over time, to develop a solid foundation.
        - To this end, NIH should improve strategies for cross-IC funding that can help HBCUs, TCUs, and other historically underrepresented universities and colleges be more competitive for research funding are very much needed. The majority of the funding largely goes to traditional ivory tower institutions.
            - One particular challenge is that NIH funding is very focused on randomized control trials, and these studies are more challenging to perform in under-resourced settings. If the funding opportunities were to require more diverse participation from HBCUs, TCUs and other disadvantaged communities, this could facilitate equity in participation in research.
            - One option to address this challenge is to add funding supplements to all submissions, particularly randomized controlled trial submissions, to establish partnerships with HBCUs, TCUs, and other historically underrepresented universities to enhance *both* the recruitment of underrepresented minorities and the prospective design of such studies to be inclusive by design would accelerate diversity of these studies overall.
            - Another valuable, bolder alternative is to actually consider HBCUs, TCUs and other underrepresented communities as equal partners rather than a

supplement or addition to existing funding, taking into account that they represent a portion of the population and can provide insights that may not be fully understood or accepted by other institutions. Funding can be granted directly to these institutions with partner institutions that may have more resources, to expand infrastructures to support clinical trials and other types of research.

- Expanding diversity across NIH leadership, from the NIH directors to project and scientific officers, may help to change the culture throughout the academic landscape. We recommend that NIH could influence or create programs that foster partnerships with underrepresented high schools and community organizations to create a diverse workforce. Funding should be shared with the underrepresented schools and organizations rather than controlled by the wealthier academic institutions.

- Where stakeholder-led organizations exist, partnerships with the NIH could serve to enhance the NIH's awareness of the self-identified needs of diverse communities in science, while also raising awareness within these groups of opportunities at the NIH. One example is the Black Women in Computational Biology Network (https://www.blackwomencompbio.org), which is an organized community of women at various career stages who would potentially benefit from NIH resources such as mentoring or outreach, and would provide the NIH with opportunities to engage with researchers at various career stages to learn about the resources, outreach, etc. that would most benefit their community.

- Traditionally well-funded institutions have grant submission processes that are often well-resourced, departments that are well-staffed, and early faculty benefit from having formal and informal internal peer review processes in place. Addressing these challenges by providing "*grants to support grants*" for consortia of HBCU, TCU, and other historically underrepresented universities, colleges, and community colleges could help some researchers to "break through," and could kick-start research programs that might not otherwise be viable.

- *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.*

  - There is a need to improve K-12 science education - especially in rural settings and urban lower socio-economic settings - and to make it more equitable for everyone. This is the single greatest barrier to a more demographically diverse scientific workforce. Create pipelines and incentives for students - and their teachers - all the way from K-graduate school. It should not be assumed someone knows what a scientist or academics is or what they would look like or do.

  - Beyond improvement in science education, improve facilities and infrastructure for STEM education and exposure. This could be achieved by funding and harnessing the

outreach of grass roots programs such as *Skype a Scientist* (https://www.skypeascientist.com), which can inexpensively provide exposure to science careers for those in rural and low socio-economic status environments. Provide incentives for established, well-funded institutions and scientists to be involved in these efforts.

- Many programs are designed based on traditional formats and processes that are not flexible enough for those in underserved populations. Partnering with large academic organizations often requires onsite full-time participation. This doesn't allow individuals with families and jobs to work towards degrees, certifications, or roles that will enhance their careers. Many are rejected from opportunities that could not only change their lives but enhance their communities. For example, one academic institution required a trainee to shadow onsite, full-time for four months to gain the experience needed to learn the clinical trial process. This individual had a family and job and couldn't afford to leave either for only 4 months. When they presented a flexible option, it was rejected without future consideration. This individual was able to gain the experience remotely (with some visits) at another organization, but their experience is not fully recognized because it didn't come from a "well-known" institution.

- Lack of diversity isn't only about the more obvious demographics, but also exclusion and bias based on career trajectory, perspectives, experience, and skills. Substantial "credit" is given based upon someone's degree and institution at which that degree was obtained, instead of recognizing people for what they've accomplished and the roles they have played. In science, we tend to lack long term investment in the idea of diversity of perspectives and experiences. This is realized in the context of job search committees or educational programs having overly restrictive criteria and in our selection of candidates for awards, panels, committees, and leadership opportunities.

- Addressing, recognizing, and preventing gender-based and sexual harassment, and disrespect in the workforce. A disproportionate number of women are at the top level of scientific jobs compared to men, for a variety of factors, but it can be partially attributed to an unwelcoming environment where women do not feel comfortable or feel harassed.

- One step towards enforcing equality in NIH-funded research is to penalize harassment in a laboratory context that introduces bias towards individuals based on gender, race, sexuality, disability, etc. This precedent has been set by the American Geophysical Union, which has classified harassment in research environments as scientific misconduct, making it subject to the same consequences as other forms of scientific misconduct (https://www.nature.com/articles/d41586-018-05076-2). Similar action from the NIH would serve to significantly reshape attitudes regarding the seriousness of harassment in research because university research integrity policies are often influenced by the policies set by the NIH.

- Most training programs target underrepresented communities, but large academic organizations also need to understand cultural differences. Academic investigators should undergo mandatory training offered by local and underrepresented communities.

Training should cover issues communities want to address, such as how to partner with their communities, and the education programs that will meet the needs of their students so they can participate in programs to further their careers. Mandatory training should also include bias training for all employees, and annual refreshers should be put in place. Many times scholarships and awards are given to the “best” students, but there are many who would also benefit if given the opportunity. Sometimes it takes mentoring or additional training to overcome some of the barriers that are ingrained in our societal structures.

- *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*

    - Despite institutional efforts to create equity in Tenure & Promotion, significant disparities remain. There are many reasons for these disparities. While institutional rules may be more inclusive of faculty with diverse career development and specific personal needs or trajectories, these are often not implemented at the departmental level or in a manner equitable across departments. Traditionally “Old School” department chairs can be reluctant to adopt new criteria or may themselves be biased. In this case, there is a need to improve at the institutional level, making sure progress for incentives and tenure promotion are realizable at every level, including the department.

    - Biomedical science needs to account for diverse family needs. All types of families exist and different people have different personal burdens. While traditionally it is women one thinks of for having additional parenting and household burdents, anyone can have these burdens. If one is additionally in a disadvantaged group, despite opportunities for scientific advancement there may still be larger familial burdens in terms of time and finances. To promote equity and parity, one needs educational and career development expectations to be flexible because people are composed of not only their work life. Being more flexible in the times that it takes to get a degree, allowing flexibility in the work time and place -- all of these features can make it so that someone with different kinds or family needs can be successful.

    - Related to the topic above, educational programs should also accommodate people coming to the biomedical informatics as a second career. This means adding flexibility to training programs and making opportunities for people so they may continue their trajectories in other parts of their career and successfully balance work / life needs. This approach would purposefully open the doors to a wider arrange of perspectives across fields, encouraging better integration and benefiting research programs, and the NIH at large, thanks to a more diverse research workforce.

    - To better embrace the time and efforts invested in hiring or advancing the career of a diverse person, institutions should design and implement ways to both celebrate them and facilitate their success in the long run.

- Gather and publish best practices for onboarding the new hire. It is rewarding and also stressful to be a new member of a team; having best practices easily available for newly hired scientists and new administrative staff will start the individual on the right path and the learning curve will be less steep.
- Frequently meeting with new hires, ensuring there is guidance for the first steps of their new roles, offering a platform for their voice to be heard, are just some of the ways in which this can be achieved and assign a mentor
- Work with new hires to form collaborative, flexibly timed metrics for success that can be discussed and evolve over time. This creates a lens for advancement early in the career trajectory.
- A new hire brings new, fresh perspectives, providing opportunities; this approach can make their new perspective realizable, and help them be successful. It is also an attempt to avoid them getting sidetracked and derailed by aging and oppressive practices that may still be lingering.

- Addressing barriers inhibiting recruitment and hiring (adapted from https://diversity.oregonstate.edu/faculty-recruitment/introductory-information):
  - Use full-cycle shared governance practices: sharing of responsibilities between researchers and administration in decisions related to the work of the institution. “Full-cycle” means that administrators “close the loop” with researchers at the conclusion of the decision-making process.
  - Establish a search advocate program: A Search Advocate program is a new model for addressing interviewer bias or other inequities during the hiring process, a crucial point of career development where systematic intervention can provide tremendous benefit. Search advocates are trained search committee members dedicated to identifying potential issues and working closely with the search committee to address them; common practices involve encouraging the use of hiring rubrics, asking questions about implicit assumptions made about candidates, and suggesting useful language for position descriptions around diversity and inclusion. Information for institutions can be found at https://searchadvocate.oregonstate.edu/about/search-advocacy-beyond-osu.
  - Advance equity, diversity, inclusion and social justice: Equity, diversity, inclusion, and social justice should be at the top of the most critical principles that underpin the mission and vision of institutions, guide their priorities and actions, and become visible in their achievements. Each search should advance these principle by:
    - Articulating the equity / diversity / inclusion / social justice impact the new hire will be expected to have in the description of duties.
    - Identifying the qualifications, skills and competencies a successful candidate will need to achieve the expected equity / diversity / inclusion / social justice impacts.
    - Using just practices that increase diversity and inclusion throughout the search, e.g., consulting, taking advantage of existing institutional and HR guidelines on inclusive equitable hiring practices.
  - Make evidence-based decisions: To avoid confirmation bias (the tendency to interpret new evidence as confirmation of one’s existing beliefs), collect and

evaluate all available objective/factual evidence before reaching judgment. To accomplish this, search committees should:

- Steer clear of judgmental or inflammatory language, and take steps to identify and remove exclusive thinking; describe exactly what you see in the application materials and the candidates' interviews.
- Have stakeholders describe objectively what the candidate said or did - or what they saw in the candidate's materials - that caused them to form their conclusions.
- Each member of the search committee should ask themselves whether they have enough objective information to form a conclusion, or whether they still have just a question.

■ Anticipate and address bias: Implicit/cognitive bias is a well-documented feature of human cognition and may be reinforced by institutional or disciplinary norms, standards and systems that are needlessly narrow, rigid or restrictive. Implicit bias may result from unconscious stereotypes (which often conflict with conscious beliefs) and/or from cognitive shortcuts or heuristics that are consistent, inaccurate and outside our conscious awareness. Take advantage of the variety of resources to help search committees understand implicit bias.

- A list of biases can be found in "*Rising above. Cognitive Errors Guidelines for Search, Tenure Review and Other Evaluation Committees*" by JoAnn Moody, PhD, JD, found at http://www.ccas.net/files/ADVANCE/Moody%20Rising%20above%20Cognitive%20Errors%20List.pdf

- *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*

  - This RFI is a good start! Additional improvements have included better demographic distribution in workshops and committees and funding for diversity supplements. Diverse NIH leadership demographics also help encourage practices to increase diversity and inclusion in research institutions.

Policies and Partnerships

- *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).*

  - Gender and racial inequity has been well documented for funding portfolios across NIH. These are some examples from the peer-reviewed literature:
    - *Fund Black scientists* (Stevens et al., 2021): A nationwide network of BME women faculty collectively argue that racial funding disparity by the National

Institutes of Health (NIH) remains the most insidious barrier to success of Black faculty in our profession. They focused their attention on this critical barrier and suggested solutions on how it can be dismantled. https://www.cell.com/cell/pdf/S0092-8674(21)00011-8.pdf

- *Revising the* a Priori *Hypothesis: Systemic Racism Has Penetrated Scientific Funding* (Dzirasa, 2020): The author states that to manifest our sincerest aspirations to "enhance health, lengthen life, and reduce illness and disability," the US biomedical research enterprise must directly confront the reality of structural racism in scientific funding and the widespread denial of its existence. https://www.sciencedirect.com/science/article/pii/S009286742031223X
- *We exist. We are your peers* (Platt, 2020): The author summarizes the article by stating that we must all ask ourselves critical questions about our role in the persistence of racism in academia, its effects on our colleagues and intentional actions to improve equity for all. https://www.nature.com/articles/s41578-020-00248-x
- *NIH peer review: Criterion scores completely account for racial disparities in overall impact scores* (Erosheva et al., 2020). https://advances.sciencemag.org/content/6/23/eaaz4868
- *Topic choice contributes to the lower rate of NIH awards to African-American/black scientists* (Hoppe et al., 2019): The authors assessed that despite efforts to promote diversity in the biomedical workforce, there remains a lower rate of funding of National Institutes of Health R01 applications submitted by African-American/black (AA/B) scientists relative to white scientists. They conclude that at NIH, funding is a critical barrier to increased participation. https://advances.sciencemag.org/content/5/10/eaaw7238; https://www.nih.gov/news-events/news-releases/research-topic-contributes-persistent-gap-nih-research-grants-black-scientists

- Some proposed solutions:
  - A potential solution to these problems is an increase in FOAs that focus on areas of interest to AA/B applicants, such as research at the community and population level, as opposed to more fundamental and mechanistic investigations.
  - It is necessary to develop a training and mentoring pipeline to encourage inclusion of underrepresented populations. In the long run, this will build a stronger and more diverse pipeline of future applicants.
  - Develop new methods for nomination and selection. Inclusion of populations in the restructuring process is essential. More and different 'on ramps' for inclusion, including partial criteria matching for selections, random selection assignments, smaller/shorter requests with built milestones.
  - Building research capability within underrepresented communities, for example, direct support of Tribal IRBs or Native American BioBanks. Such capacity building efforts demonstrate commitments to benefit sharing, not just bringing minoritized individuals into traditional research.
  - Practice cultural awareness and be sensitive to avoid setting deadlines during or directly after a cultural holiday.

- *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*

    - Institutions, organizational units, educational programs, and individuals can value and incentivize team science and collaborative opportunities. By doing so, one can create structures where people from diverse backgrounds (demographics, gender, career stage, perspectives, etc.) have opportunities to be valued, demonstrate their skills, and to be successful in a broad context. This ensures an ongoing investment in the development of a diverse and inclusive participant pool across science, and can actually maximize limited resources.

    - Creating funding opportunities to support travel for visits between institutions encourages training and collaborative work. As well consider building flexibility into these exchange programs, so that traditionally strenuous scheduling demands for on-site training can be met in more accommodating timelines.

<u>Research Areas</u>

- *Significant research gaps or barriers to expanding and advancing the science of health disparities/health inequities research and proposed approaches to address them, particularly those beyond additional funding (although comments could include discussion of distribution or focus of resources)*

    - Funding for public health research is disproportionately small, receiving much less funding than new drugs, mechanistic disease research, etc. Oftentimes, members of disadvantaged communities go into biomedical science to help improve public health outlook - but then suffer retention and progression issues because their scientific interests are so underfunded and undervalued relative to other domains in biomedicine.

    - Consider using online video conference tools (such as Zoom, Google Meet, Webex, etc.) to provide mentoring to people who may not have an optimal mentoring situation, even if they are not located in the same place. In addition, these tools open possibilities to work with people anywhere in the world, all on the same team.

<u>Further Ideas</u>

- *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*

    - Consider funding training programs that support summer internships, especially repeated ones, where people from disadvantaged communities are trained in biomedical sciences, and then supported in their communities either in an educational setting or in a community communication context. The idea is to promote knowledge acquisition and dissemination within these communities, rather than the “brain drain” that can occur when trainees find themselves in more exciting, new educational contexts and then never return to their communities. An example of a successful program of this nature is

the *Summer Internship for Indigenous Peoples in Genomics (SING) Canada* where native students receive summer training in informatics, then return to their communities to teach their elders. You can learn more at https://indigenoussts.com/sing-canada

- Create data-driven innovative metrics to allow all types of institutions and organizational units to evaluate progress towards improved diversity and inclusion. This range of metrics should be appropriate for different sizes and types of institutions or discipline / science focus:
  - Change in gender balance in recruitment and retention of faculty, post-docs, and graduate students.
  - Increase in the number of educational programs leveraging gender and diversity in the instruction process.
  - Increase in programs for employees and students in gender assistance.
  - Metrics on differences in gender/demographics in time until promotion (this is a very good indicator).
  - Metrics on differences in gender/demographics for funding - number and size of funding applications.
  - Metrics on differences in publishing.

- In contrast to the last point: Achieving diversity and inclusion is always going to be ongoing work. NIH and the scientific community need to remember that the goal is to change the culture - not only to satisfy metrics, tick boxes, etc. Success is when those from underrepresented demographics seek out the scientific community because it promotes a culture of inclusion and a strong sense of shared mission.

- Create and implement strategies to recognize institutions for reducing and or eliminating institutional barriers to faculty gender equity and diversity:
  - Give special consideration or special funding opportunities for funding applications from institutions that have overcome some of the gender disparity challenges. E.g., reward institutions investing efforts and succeeding at achieving gender equity.
  - Offer an extra credential or award to successful faculty from one of these institutions.
  - Provide additional funding to the institutions as incentives for maintaining a diversity program or other educational pathway development strategies.
  - Offer support for establishing mentoring programs for newly hired faculty, such as pairing faculty mentors from diverse backgrounds with the new faculty.