



**Association of
American Medical Colleges**
655 K Street, NW, Suite 100, Washington, DC 20001-2399
T 202 828 0400
aamc.org

July 20, 2018

Alison Gammie, Ph.D.
Director, Division of Training, Workforce Development, and Diversity
National Institute of General Medical Sciences
National Institutes of Health
alison.gammie@nih.gov

**Re: Request for Information: Strategies for Enhancing Postdoctoral Career Transitions to Promote Faculty Diversity
NOT-GM-18-034**

Dear Dr. Gammie:

The Association of American Medical Colleges (AAMC) is pleased to have this opportunity to offer comments related to maintaining diversity during the transition from postdoctoral researcher to faculty position in the biomedical sciences. The AAMC is a not-for-profit association representing all 151 accredited U.S. medical schools and 17 accredited Canadian medical schools, nearly 400 major teaching hospitals and health systems, including 51 Department of Veterans Affairs medical centers, and more than 80 academic and scientific societies. Through these institutions and organizations, the AAMC represents more than 173,000 faculty members, 89,000 medical students, 129,000 resident physicians, and more than 60,000 graduate students and postdoctoral researchers in the biomedical sciences. Our comments reflect input from many of these constituents, primarily collected through our Group on Graduate Research, Education, and Training (GREAT), Group on Research Advancement and Development (GRAND), Group on Diversity and Inclusion (GDI), Group on Women in Medicine and Science (GWIMS), and Council of Faculty and Academic Societies (CFAS)¹. While the AAMC's comments here focus on general themes, we have encouraged our member institutions to respond as well.

The AAMC recognizes the value of training new generations of biomedical researchers from diverse backgrounds. Workforce diversity of individuals from underrepresented (UR) groups in biomedical research (including racial and ethnic minorities underrepresented in research, women, persons with disabilities, and first generation college students as well as other individuals from disadvantaged

¹The GREAT Group is AAMC's professional development group for graduate school deans, MD-PhD program directors, and postdoctoral program directors who have responsibility for biomedical PhD, MD-PhD, and postdoctoral training occurring within medical schools and teaching hospitals. GRAND is a professional development group for research deans and deans of clinical and translational research at these same institutions. The GDI group focuses on activities that promote the benefits of diversity and inclusion in medicine and biomedical sciences, with a specific focus on the successful and progression of minority faculty. The Group on Women in Medicine and Science (GWIMS) advances the full and successful participation and inclusion of women within academic medicine by addressing gender equity, recruitment and retention, awards and recognition, and career advancement. CFAS is AAMC's council comprising faculty representatives appointed by medical schools and academic societies, providing a voice for academic faculty within the AAMC's governance and leadership structures.

backgrounds) is important in optimizing the perspectives needed to solve complex biomedical problems. As we note below, the inclusion of diverse perspectives and backgrounds has a demonstrable influence on the development of research questions, the production of innovative research partnerships, and discovery itself. Moreover, as science becomes more complex and challenging, the nation cannot afford to exclude new talent because of obsolete stereotypes and barriers.

The AAMC commends the NIH for developing an array of programs across the undergraduate, graduate, post-doc spectrum to increase diversity, and we are supportive of NIGMS's efforts to evaluate its programs success after their launch. The AAMC also thanks the NIH for their focused attention on increasing diversity in the research workforce through efforts such as NIH Advisory Committee to the Director Working Group on Diversity.

Recent studies²³ have shown that while students from underrepresented groups are almost as likely as those from well-represented groups to matriculate into a doctoral program, receive a doctoral degree, and acquire a postdoctoral position, proportionally fewer transition to tenure-track faculty. The AAMC thanks the NIGMS and NIH for recognizing the need for additional strategies to foster faculty diversity in academic research positions.

The following is a summary of AAMC's recommendations to NIGMS, described further below:

- The NIH should lead an effort to determine why there is such a substantial drop in diversity in the transition from postdoctoral programs to faculty positions.
- High quality mentoring tailored to the needs of individual UR scientists should be provided to encourage success in research-track careers
- The research track career should be made more attractive and inclusive for UR Scientists by promoting community, networking opportunities, and transparency
- The NIH should consider specific funding and programs to maintain diversity from the postdoctoral research position into faculty
- Faculty and administration should be trained against all types of biases to create an inclusive environment
- Funding agencies and institutions should provide resources to help institutions create an attractive and inclusive environment to increase the diversity of the applicant pool
- Leaders should ask UR researchers what needs to be improved at their own institutions to find and make local improvements
- NIH should consider curating or supporting a centralized location for online resources, including a data dashboard

² K. D. Gibbs et al., "Decoupling of the Minority Phd Talent Pool and Assistant Professor Hiring in Medical School Basic Science Departments in the Us," *Elife* 5 (2016).

³ L. C. Meyers et al., "Survey of Checkpoints Along the Pathway to Diverse Biomedical Research Faculty," *PLoS One* 13, no. 1 (2018).

The Barriers Scientists from Underrepresented Groups Face in Progressing from Postdoctoral Training into Faculty Positions

Scientists from UR groups face a number of barriers throughout their scientific careers, several of which may inhibit the transition of those from UR groups into academic faculty positions. First and foremost is the struggle against racism⁴, sexism⁵, and elitism. While overt discrimination is very damaging, even small instances of biases or microaggressions can leave UR scientists feeling isolated. These scientists often must also overcome more practical disadvantages, such as a lower funding rates⁶, lack of mentoring specific to their needs, fewer mentors from similar backgrounds, a misalignment between institutional and their own values⁷, and personal factors⁸. All of these issues, which are felt more acutely by UR groups, could contribute to a decision to leave the academic STEM workforce.

Diverse individuals pursue diverse areas of research, and there is concern in the research community that certain types of research may not be as valued as others and therefore may a disincentive for some individuals from pursuing academic research careers. As noted by Hannah Valantine, M.D., M.R.C.P, during her report to the NIH Advisory Committee to the Director, NIH has data to show that research topic choice does contribute to R01 funding differences. Research is needed to see if this disparity has a greater effect on UR scientists.

Finally, because of an admirable desire to promote diversity on various academic committees and groups, at many institutions the small pool of UR trainees and scientists is asked to serve more frequently. This service is typically uncompensated and may not be formally recognized in the promotion and tenure process. This 'diversity tax' takes time away from their research that those with whom they are competing are not asked to give.

The Qualities and Perspectives that Individuals from Underrepresented Groups Bring to the Research Enterprise

Not only are diversity and inclusion ethical goals to achieve, they are measures of excellence. The multiple viewpoints of a diverse team will usually have greater creativity and may be more effective at

⁴ D. Mehta, "Lab Heads Should Learn to Talk About Racism," *Nature* 559, no. 7713 (2018).

⁵ Engineering National Academies of Sciences and Medicine, *Sexual Harassment of Women: Climate, Culture, and Consequences in Academic Sciences, Engineering, and Medicine* (Washington, DC: The National Academies Press, 2018).

⁶ D. K. Ginther et al., "Race, Ethnicity, and Nih Research Awards," *Science* 333, no. 6045 (2011).

⁷ K. D. Gibbs, Jr. and K. A. Griffin, "What Do I Want to Be with My Phd? The Roles of Personal Values and Structural Dynamics in Shaping the Career Interests of Recent Biomedical Science Phd Graduates," *CBE Life Sci Educ* 12, no. 4 (2013).

⁸ E. H. Ellinas, N. Fouad, and A. Byars-Winston, "Women and the Decision to Leave, Linger, or Lean In: Predictors of Intent to Leave and Aspirations to Leadership and Advancement in Academic Medicine," *J Womens Health (Larchmt)* 27, no. 3 (2018).

complex problem solving⁹ and group learning¹⁰ than a team of high-achievers alone. More diversity leads to more innovation.¹¹

Perhaps most importantly, a diverse group of researchers will lead to both pursuing more diverse research questions and connecting with diverse communities. Perhaps having a more diverse community of researchers would lead to a more expansive portfolio of research avenues being explored.

A diverse research workforce also allows increased engagement of groups traditionally underrepresented among research participants. An excellent example of how diverse researchers can lead to diverse research and community engagement is the Collaborative Research Center for American Indian Health (CRCAIH) program, funded by NIMHD¹². This program, which prioritizes “good science, community engagement, and constant respect for tribal sovereignty,” began as smaller project, the Safe Passage Study, a research grant funded by NICHD, to study the higher rate of Sudden Infant Death Syndrome in American Indian/Alaska Native populations¹³. Because American Indian investigators were part of the research team, the research group was able to earn the trust of and engage with the native population, leading to the success and expansion of the program. In this case the, racial and ethnic characteristics at the independent investigator level could led to a greater scope of research and a higher likelihood of success in engaging with affected communities.

Approaches that Key Stakeholders Can Employ

When strategizing how stakeholders could increase diversity in early faculty positions, two different phases should be considered. First, faculty positions must be made an achievable and desirable goal for all graduate students and postdoctoral researchers. Second, upon entering an early faculty position, the environment must be inclusive to ensure retention. Here, we propose strategies to support both of these outcomes.

Preparing for Independence

Additional Research on Causes

The NIH should lead an effort to determine why there is such a substantial drop in diversity in the transition from PhD programs to faculty positions. As stated previously, cross sectional studies indicate there are two periods of time when the diversity of the STEM population becomes less diverse: during

⁹ Scott E. Page, "Making the Difference: Applying a Logic of Diversity," *Academy of Management Perspectives* 21, no. 4 (2007).

¹⁰ Petru L. Curşeu and Helen Pluut, "Student Groups as Learning Entities: The Effect of Group Diversity and Teamwork Quality on Groups' Cognitive Complexity," *Studies in Higher Education* 38, no. 1 (2013).

¹¹ Rocio Lorenzo and Martin Reeves, "How and Where Diversity Drives Financial Performance," *Harvard Business Review* 2018.

¹² "Collaborative Research Center for American Indian Health ", <https://crcaih.org/>.

¹³ "Grantee Helps Build American Indian Health Research through Trans-Disciplinary Collaboration," <https://www.nimhd.nih.gov/news-events/features/community-health/american-indian-health-research.html>.

undergraduate years and at the transition from Post-doc to faculty^{14 15}. More research is needed to determine why this loss occurs. For example, are UR applicants applying in lower percentages for faculty positions or are they less successful when applying? How can institutions better align their values to match those of a more diverse pool of applicants? How can institutions better provide tailored mentorship to meet the needs of all? The AAMC asks the NIH to consider mechanisms to support such research.

Provide High Quality Mentoring Tailored for the Unique needs of UR Scientists

High quality mentoring is essential to success in graduate studies and independent research¹⁶, and mentorship can help UR scientists continue into research-track careers¹⁷. While all postdoctoral researchers and early career faculty need guidance on their work, such as research career paths, grant writing, and running a lab, UR scientists have unique mentoring needs¹⁸. They may benefit from mentorship from a mentor they identify with, who can help guide them with challenges unique to their background. In addition to having a more diverse faculty pool from which young researchers could find mentors, training all faculty on how to help young researchers deal with instances of bias could create a more inclusive environment and encourage UR scientists to continue on the research track. Existing resources could be improved and used to design such a training curriculum, such as the NRMN Culturally Aware Mentoring (CAM) Mentor Training Module¹⁹. Opportunities for peer mentoring, other more informal networks, and online resources could also help UR scientists find avenues for guidance and solidarity. For example, the AAMC Group on Women in Medicine and Science (GWIMS) has provided a Toolkit in the form of a series of presentations designed to provide practical guidance on a variety of topics relevant to women faculty in academic medicine²⁰.

Make Research Careers Attractive to UR Scientists

Starting an academic research career can be a daunting task for anyone, and given the barriers for UR scientists, it is essential that a research track be made attractive and inclusive for those considering this path^{21 22}. While efforts focused on providing resources to UR scientists to close the diversity gap are commendable, these efforts can have the unintended effect of making the individual feel isolated from

¹⁴ Gibbs et al.

¹⁵ Meyers et al.

¹⁶ C. Pfund et al., "Defining Attributes and Metrics of Effective Research Mentoring Relationships," *AIDS Behav* 20 Suppl 2 (2016).

¹⁷ A. M. Byars-Winston et al., "Culturally Diverse Undergraduate Researchers' Academic Outcomes and Perceptions of Their Research Mentoring Relationships," *Int J Sci Educ* 37, no. 15 (2015).

¹⁸ M. R. Mahoney et al., "Minority Faculty Voices on Diversity in Academic Medicine: Perspectives from One School," *Acad Med* 83, no. 8 (2008).

¹⁹ "Culturally Aware Mentoring: A New Mentor Training Module," National Research Mentoring Network, <https://nrmnet.net/culturally-aware-mentoring-a-new-mentor-training-module/>.

²⁰ "Gwims Toolkit," Association of American Medical Colleges, <https://www.aamc.org/members/gwims/toolkit/343518/toolkithometsr.html>.

²¹ J. A. Whittaker, B. L. Montgomery, and V. G. Martinez Acosta, "Retention of Underrepresented Minority Faculty: Strategic Initiatives for Institutional Value Proposition Based on Perspectives from a Range of Academic Institutions," *J Undergrad Neurosci Educ* 13, no. 3 (2015).

²² Gibbs and Griffin.

their local scientific community by singling them out as 'other'. It is a difficult balance between the two, and one way to counteract that isolation could be to ensure that diversity and inclusion resources are available to the entire community so that everyone is aware of the issues and everyone shares in the responsibility for inclusiveness. Additionally, inviting UR scientists to campuses to give presentations on their work and network, outside the context of a job interview, could be a less formal way of lowering barriers and making connections, although if this becomes a standard it could add to the 'diversity tax.' Also, focusing more on institutional diversity efforts during recruitment could show UR scientists that they are valued. UR scientists that come from a disadvantaged background may not be as educated on the necessary steps to reach a faculty position. Dissemination of a clear framework to populations that need it, perhaps as part of NIH efforts to provide career exposure to students, could help guide UR trainees and make them feel included in the academic community. All of these strategies may help increase STEM identities in UR trainees, keeping more of them in the research track²³.

Implement Programs to Support UR Scientists in the Transition to Independence

AAMC asks the NIH to consider specific funding and programs to maintain diversity from the postdoctoral research position into faculty. We commend the recent initiation of the pilot NINDS BRAIN Initiative Advanced K99/R00 - Postdoctoral Career Transition Award to Promote Diversity. K awards effectively boost early career researchers into faculty positions and focusing this award specifically to promote diversity will likely have a meaningful effect. Dr. Valantine and Jon Lorsch, PhD, director of NIGMS, also discussed the possibility of piloting a national cohort transitional award for individuals underrepresented in research, similar to a K99/R00. A cohort model could build solidarity and provide a peer network to lean on, but it would be necessary to ensure that the group remained cohesive through well-managed activities, such as in person and online meetings, to create a real feeling of community – a model which may work more effectively on a regional level than a national one. Also, longer-term R awards, such as the NCI's Early Investigator Stage MERIT award, and other awards focused on supporting early stage investigators could promote additional stability for investigators from underrepresented groups along their research career²⁴. In addition to piloting similar awards, NIH should be intentional about encouraging research on institutional change. The AAMC applauds the NIGMS for the increased emphasis on diversity in its new predoctoral T32. More funding opportunities to pilot methods to increase and maintain diversity, such as the NIH Broadening Experiences in Scientific Training (BEST) and the National Science Foundation's ADVANCE program, should be available and accessible.

Creating an Inclusive Environment for Retention

Some strategies mentioned above could also be applied to create an inclusive environment for faculty, which would increase both recruitment and retention of diverse junior faculty. This includes gathering data on diversity questions that affect faculty as well as trainees. Also, continuing mentorship and mentorship training that meets the needs of UR faculty would both help them be successful researchers

²³ Tara D. Hudson and Karen J. Haley and Audrey J. Jaeger and Allison Mitchell et. al. "Becoming a Legitimate Scientist: Science Identity of Postdocs in STEM Fields." *The Review of Higher Education* 41, no. 4 (2018): 607-639.

²⁴ S. Nikaj et al., "Examining Trends in the Diversity of the U.S. National Institutes of Health Participating and Funded Workforce," *Faseb j* (2018).

and help create a desirable culture, as would ensuring that diversity and inclusion resources are available to all.

Enhance Training to Control Bias

To create an inclusive environment, it is crucial that faculty and administration are trained against all types of biases. While training is not sufficient to shift culture towards inclusiveness, such a shift cannot occur without basic knowledge of what bias is and how it affects its victims. Training should include strategies to fight conscious and implicit/unconscious bias about all kinds of prejudice, including race and ethnicity, religion, gender, sexual minority, institutional pedigree, and disability. It should also include awareness and avoidance of micro-aggressions, which are often overlooked but create a hostile environment. Training should include thoughtful, effective exercises both on and off paper to truly engage the community.

Employ Strategies to Attract a Diverse Applicant Pool

While bias training for search committees is important, it will not improve diversity unless an institution is able to attract a diverse applicant pool. As mentioned above, inviting UR scientists at all levels to give seminars and network outside of a job search could create a more welcoming environment. Additionally, funding agencies and institutions could provide resources to guide institutions in becoming more inclusive. Columbia University Vagelos College of Physicians and Surgeons has publicly available Guidelines for Promoting a Bias-Free Curriculum for medical trainees²⁵. The NIH has recently created a Science Workforce Diversity (SWD) toolkit²⁶, which provides institutions with strategies to identify faculty candidates from diverse backgrounds, reach out to get a more diverse applicant pool, and minimize implicit bias at their institution. Such efforts as these should be widely disseminated, and the AAMC is happy to extend its help in these efforts, to build on the July 30 AAMC-hosted webinar with Dr. Valentine on the SWD toolkit and beyond.

Ask Current UR Scientists

Asking UR researchers what needs to be improved at their own institutions may another effective way to find problems and make local improvements²⁷. Even so, many UR scientists may be unaware of what they should expect from their communities and what should be changed, so such inquiries should be a conversation to help determine needs and what could be done to fulfill them.

Centralized Resources

Many of the recommendations presented here depend on data and resources being available online. Making a centralized location, perhaps curated or supported in part by the NIH, of these resources is vital to ensuring access to all, as keeping them located on different institutions' websites will inhibit many young researchers from being aware that they exist. An NIH led data dashboard, as suggested by

²⁵ "Guidelines for Promoting a Bias-Free Curriculum," Columbia University Vagelos College of Physicians and Surgeons, <https://www.ps.columbia.edu/education/student-resources/honor-code-and-policies/guidelines-promoting-bias-free-curriculum>.

²⁶ "Nih Scientific Workforce Diversity Toolkit," National Institutes of Health, https://diversity.nih.gov/sites/coswd/files/images/2018-01/SWD_Toolkit_Interactive-updated_508.pdf.

²⁷ Mahoney et al.

Dr. Hannah Valentine at the June ACD meeting, could be an excellent start to this centralization. It would serve the community to make current NIH data easily available, so data could be quickly looked up, such as the success rate and diversity of early career awards such as K99s. This dashboard can be a model for other institutions to share their diversity data.

Current Successful Strategies in Promoting the Transition of Postdocs from Underrepresented Groups into Faculty Positions

A number of AAMC member institutions have begun implementing various strategies to increase diversity and inclusion. Many of these programs, which use some strategies mentioned above, have already begun to receive positive feedback. Bias training of all types for faculty and search committees are now being implemented at many institutions. Mentoring is widely recognized as an essential part of success, and efforts to increase the quality of mentoring for UR scientists include creating individual postdoc development plans with strategies to seek out good mentors and selecting a focused mentoring team for new faculty by both the new faculty themselves and the department chair.

Some institutions are attempting to create an inclusive environment by hiring a consultant company to help recruit minorities and having 'diversity days' for recruitment that highlight a school's commitment to diversity. Vanderbilt and University of Alabama have implemented seminar and networking programs to invite UR scientists to speak without job interview pressure, receiving enthusiastic responses to such events. University of Wisconsin recently opened an office of diversity and inclusion that is largely focused on using analytical software to gather diversity data that will be made available both internally and externally. And some individual UR faculty have taken the initiative to renegotiate their appointments in return for their higher level of service, a strategy that institutions could implement for their UR faculty.

Wayne State University's Postdoctoral to Faculty Transition Fellowship Program²⁸ is a 3 year intense biomedical postdoctoral experience, for fellows from groups underrepresented in research and who are interested in studying disparities in STEM, which guarantees a faculty position if all milestones are achieved. While this program is only two years old, two postdoctoral researchers have transitioned into faculty positions in less than a year.

A three-step process to increase gender diversity in faculty was implemented at Montana State University²⁹. To enhance recruitment of women into STEM faculty positions, this study used a three step faculty search intervention to fulfill psychological needs during recruitment: 1) Provide a "faculty search toolkit" to HR with concrete strategies, 2) Enhance the autonomy of the search committee through an oral presentation on gender bias to control their own implicit bias, and 3) Enhance relationships in the recruitment process by connecting search committee with peer faculty and connecting job finalists with an independent faculty for confidential conversation. When compared to a control group receiving

²⁸ "Postdoctoral to Faculty Transition Fellowship (Pft) Program," Wayne State University, <https://gradschool.wayne.edu/pft-fellowship>.

²⁹ J. L. Smith et al., "Now Hiring! Empirically Testing a Three-Step Intervention to Increase Faculty Gender Diversity in Stem," *Bioscience* 65, no. 11 (2015).

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normal recruitment procedures, the percent of women in the hiring pool at every stage of hiring was increased. The authors propose that this three-step intervention could be used to advance diversity along any dimension, not just women in STEM.

The University of California (UC) and University of Michigan led program, Partnership for Faculty Diversity³⁰, offers postdoctoral research fellowships, faculty mentoring, professional development and academic networking opportunities to scientists from UR and non-traditional education backgrounds at over a dozen research institutions. This program stems from the successful President's Doctoral Fellowship Program started at UC over 30 years ago, from which 75% of the fellows have found faculty appointments, many on UC campuses.

AAMC appreciates the opportunity to comment on strategies to maintain diversity from postdoctoral training to faculty positions, and we look forward to working with the NIGMS on this issue. Please feel free to contact me or my colleague, Amanda Field, PhD., Science Policy Specialist (afield@aamc.org) with any questions about these comments.

Sincerely,

A handwritten signature in blue ink that reads "Ross E. McKinney, Jr., MD". The signature is stylized and cursive.

Ross E. McKinney, Jr., MD
Chief Scientific Officer

A handwritten signature in black ink that reads "David Acosta". The signature is cursive.

David Acosta, MD
Chief Diversity and Inclusion Officer

³⁰ "President's Postdoctoral Fellowship Program," University of California, <https://ppfp.ucop.edu/info/about-ppfp/index.html>.