

FoR Response to NIGMS RFI for Strategies to Enhance Postdoctoral Career Transitions to Promote Faculty Diversity

[Blog post](#) and [RFI](#)

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

Two major barriers exist at the postdoc-to-faculty transition: the inability of institutions to hire more faculty from underrepresented populations; and the increased reluctance of those from underrepresented populations to follow the academic path due to a lack of belonging in academe, or a lack of incentive to fulfil their desires to effect change.

These barriers have been highlighted in work familiar to NIGMS by Dr. Kenneth Gibbs, Jr., namely, "[Decoupling of the minority PhD talent pool and assistant professor hiring in medical school basic science departments in the US](#)" (eLife, 2016); and "[Biomedical Science Ph.D. Career Interest Patterns by Race/Ethnicity and Gender](#)" (PLoS One, 2014) and "[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 Sciences, 2013) as discussed in [Science Careers](#), respectively.

Those from underrepresented groups face barriers that are systemic and require change, because it is by their very design that some groups have and continue to succeed in this system. Simply increasing the population of those from underrepresented groups in a system that is not changing to reflect the needs and desires of this group, as it meets the needs and desires of those who are currently well-represented, will be insufficient.

Key strategies to address this should focus on aiding the transition to faculty positions; but also on retention and on incentivizing changes to the cultural norms of academe to ensure that people from these populations are not only present, but thrive. A mechanism that has aided the postdoctoral-to-faculty transition is the K99/R00 mechanism which is a fundamental starting point for NIGMS to consider utilizing specifically for those from underrepresented populations, such as [the BRAINS Diversity K99/R00](#), but with specific modifications to counteract the weaknesses of this mechanism as discussed below. To address retention, institutions looking to attract this talent that such a transition mechanism could identify must meet certain criteria, including having diversity and mentoring plans in place, as well as active efforts to seek to retain faculty from underrepresented populations, including but not limited to fostering an inclusive environment, which provides mentorship and does not result in faculty from underrepresented populations carrying out an undue, burden of service (i.e. the "minority tax"). NIGMS should have a mandatory reporting requirement where faculty rate the institution for these cultural disconnects, support, etc.

Aggressive university start-up packages without fund expiration dates (that are not simply replaced by the “R00” component of a K99/R00-like mechanism) and standardized coverage of moving expenses, coupled with continual opportunities for seed funding (that are not just provided at time of hire but instead provide opportunities for more sustained financial investment) should be a considered requirement for NIGMS to expect of recipient institutions, to ensure that the institution is as committed to the investment in the investigator as NIGMS. Recognition of service carried out by faculty in tenure and promotion should also be demonstrated by an institution, so that this labor is rewarded and factored into tenure decisions, as this work is more often carried out by women and minorities, but does not receive the recognition that it deserves in research departments. In the NIGMS T32 ([PAR-17-341](#)) the review criteria for institutional and departmental commitment to the program highlight institutional policies that should be in place to score highly on the grant. Questions like these should be written into potential training/transition grants to motivate institutions to change their promotion structure. Similarly, peer-to-peer/cohort hiring and senior mentorship plans should be in place and demonstrated to NIH as a condition for receipt of funds by an institution.

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

NIGMS will already be aware of the [science of workforce diversity](#) resource maintained by the Office of Scientific Workforce Diversity at NIH. Suffice it to say that it requires a diversity of experiences, perspectives and expertise to solve problems and innovate; and the perspectives that those from underrepresented populations bring to teams with a lack of diversity are just as much an essential criterion of solving a problem as bringing in those with specific technical skill sets.

In addition, training is an inherent part of the research enterprise. The U.S. taxpayer invests considerable sums of money in providing the NIH with its mostly-trainee workforce, and therefore it should be central to the mission of NIGMS to ensure that those being trained are representative of those paying for that training. Therefore ensuring that training environments are inclusive, and adequate mentoring environments, for all within it, are critical. This is only possible again with a diverse faculty population guiding that training and building an inclusive training environment, that also seeks to solve difficult problems to the benefit of society. It is particularly important for faculty from underrepresented populations to be visible role models, but also for the entire faculty body to be working together to accommodate all needs and requirements, to the success of all involved.

A lack of representation indicates to the current trainee population that they will not be welcomed into the professoriate at research-intensive institutions, and that differences in approaches to solving problems are not welcome. This not only encourages those from underrepresented populations to leave; it means that the science and the approaches they bring are also lost to the research enterprise.

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

Any approaches that are carried out in attempts to promote successful career transitions of postdoctoral scientists from underrepresented groups into the professoriate at research-intensive institutions should be studied and published, regardless of whether or not they succeed, to solve this problem in the same way as scientists try to solve any other research question. This requires in particular that faculty advisors and institutions count and track their postdocs; that scientific societies facilitate knowledge-sharing within and between communities; and that funding institutes such as NIGMS provide the incentives within their awards to do so.

Providing a specific K99/R00-like mechanism for hiring faculty from underrepresented populations is a direct example of an approach that NIGMS could carry out, and study, comparing and contrasting both the parent K99/R00 (in which the small number of black applicants, for example, have [half the success rate](#) of white applicants) and the BRAINS Diversity K99/R00. In addition NIGMS could encourage use of and knowledge around diversity supplements, as mentioned in Recommendation 5.5 of the National Academies' ["The Next Generation of Biomedical and Behavioral Sciences Researchers: Breaking Through"](#) report (2018).

Approaches employed by ALL stakeholders should attempt to resolve cultural disconnects within the research enterprise, and resolve underlying issues, including but not limited to:

- Financial insecurity - e.g. by ensuring that postdocs are paid salaries consistent with repeated recommendations, and that attempts are made by institutions and NIH to reduce training times;
- Mental health - e.g. giving postdocs access to institutional student health and counselling services;
- Feeling of isolation - e.g. through mentoring and peer-support networks at institutions and in scientific societies; with time out of lab mandated and funds provided to support efforts adequately, and with requirements for receipt of funding conditional on such support networks being demonstrable to NIGMS;
- Work/life balance - e.g. setting realistic time limitations similar to medical residents (particularly given that institutions track vacation time, but not overtime);
- Pressure to publish in certain journals - e.g. supporting the use of preprints and peer review training activities that recognize the scholarship of researchers and not an indirect measure of a journal's "impact";
- Funding Insecurity - e.g. provide postdocs with training and control of funds/funding through fellowship mechanisms, including grant writing training and fund management,

rather than suppressing potential independent research paths by placing them on another investigator's research grant, fulfilling another investigator's aims

- Lack of adequate mentoring - e.g. requiring those who have trainees to be competent mentors;
- Insufficient management training that impacts the current and future training environment - e.g. requiring that postdoctoral training including both management and mentoring training required to competently manage a research group; ensuring that faculty also have such training that is refreshed periodically, including an introductory mandatory management training course in their first semester on the job; and only awarding funds to institutions that have such programs in place. Such requirements exist for treatment of animals, and all stakeholders should ensure that treatment of employees is similarly held to a certain standard. Likewise training on implicit and unconscious bias, particularly immediately before hiring or peer review activities, and sexual harassment training should be in place, similar to training for misconduct in research requirements.

Research intensive institutions should be encouraged to make diversity statements a requirement for faculty applications, and NIGMS could provide guidance on using these early in the evaluation process.

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

NIGMS should look to the great success of their own [IRACDA \(K12\)](#) award, which has successfully retained many researchers from underrepresented populations as faculty in academic settings with a focus on teaching. This program provides training and directly rewards those who may otherwise have left academe because of a lack of incentives for them to stay and carry out the work that drives them. The IRACDA experiment should be expanded and other similar programs could be considered, including but not limited to those wishing to become excellent mentors; scientific communicators; or scientific leaders in academic settings. NIGMS could consider incentives for institutions to experiment with development of such initiatives.

The NGRI working group has suggested (see [Slide 36](#)) expanding [MIRA](#) (R35)-like support to Early Stage Investigators and NIGMS should also pay particular attention to whether transitions may be aided by such a mechanism in place, particularly targeted to new faculty from underrepresented populations.

The K99/R00 is an example of a mechanism that has successfully aided postdoctoral-to-faculty transitions but has become entangled with usual markers of prestige and pedigree that taint many NIH award mechanisms, and has demonstrably failed in aiding applicants from underrepresented populations - black applicants are half as likely to receive an award as white applicants, and black awardees are significantly less likely to make the transition to the R00 phase as white awardees, as described by [Rescuing Biomedical Research](#). The [BRAINS Diversity K99/R00](#) is an example to compare any NIGMS approach with, particularly considering adding a component where the awardees from each cycle could have a meeting at NIH to meet, and discuss their projects and issues they encounter. K awards (see [RFA-HL-18-026](#)) often have written into them requirements that travel should be budgeted to visit NIH for 2 day meetings to discuss their projects. Awardees should have the opportunity to meet up at least once a year. Especially since when it comes to retention, cohort models in undergraduate programs have done a good job in promoting those from underrepresented population into STEM (see the [Meyerhoff Scholars Program at University of Maryland Baltimore County](#)). Those from underrepresented populations transitioning to faculty may often lack support within their institution, and NIGMS could consider ways they can provide that support for its awardees. Similarly programs such as the Howard Hughes Medical Institute's [Hannah Gray](#) Fellows Program could be used as a point of comparison.

5. Any other comments or recommendations for NIGMS to consider with respect to programmatic efforts to enhance career transitions of postdoctoral scientists from diverse groups into the professoriate at research-intensive institutions

Providing support in the transition is important but if someone from an underrepresented population does not feel supported in the postdoc early on, prior to the transition, they may exit the academic track well before the transition begins. What is NIGMS doing to ensure such postdocs are being supported? Are there any experiments under way directly targeting postdocs, such as mentoring networks, Multi-PI mentoring requirements, or incentives to change reporting structures at institutions for those funded from mechanisms such as Diversity Supplements? These could be discussed particularly to support postdocs in an abusive mentor-mentee relationship.

Initiatives should be focused on ways to give the mentee more power so they can have the stamina to begin the transition in the first place. Creating grants specifically for URM postdocs for transitioning to independence could be key, as well as particularly addressing the identified racial and ethnic disparities in who receives F32 funding (see "[The Impact of Postdoctoral Fellowships on a Future Independent Career in Federally Funded Biomedical Research](#)", Heggeness et al., NBER, 2018), particularly given the correlation between receiving an F32 award and subsequently receiving R01 funding. Longer fellowships/grant mechanisms going all the way to the faculty position (i.e. for 4-5 yrs) could ensure retention into faculty, and the [Hanna Gray Fellowship Program](#) from HHMI is a good example of this continued support.