Responses submitted by the National Postdoctoral Association to NIGMS in response to the following Request for Information:

"Initiatives That Improve Research Training, Career Progression, or the Educational Environment in the Biomedical Research Enterprise."

https://www.research.net/r/NIGMS_TWD_RFI

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The ways in which NIGMS-supported research training, career progression, or the educational program(s) listed above have been beneficial.

The National Institute of General Medical Sciences (NIGMS), in its 60th year, has a highly respectable history of supporting basic science and the future leaders in science.

The IRACDA program has a decades-long history of transitioning vibrant postdocs successfully into faculty careers, especially postdocs from historically marginalized populations. This program provides a unique structure that facilitates mentor-mentee relationships, peer cohort support, and connections with the broader community through local teaching that truly benefits the scientific enterprise as a whole. Furthermore, the IRACDA program’s travel and professional development funds are successful at supporting research training, career progression, and educational programs collectively. Many postdocs and their institutions do not have funds available for travel, even though it can be vital to a postdoc’s training and career progression to travel for scientific conferences, which provide networking and learning opportunities with scientists outside of their labs. However, slots for IRACDA fellows per year have shrunk significantly due to stagnant program funding levels in the last decade.

The NPA applauds the MOSAIC K99/R00’s commitment to transitioning talented and diverse postdocs to faculty positions and utilization of a supportive cohort model. Additionally, the award has a beneficial policy that doesn’t count parental, medical, or other well-justified leave towards the 4-year eligibility limit. Being an early-stage investigator is stressful, but the inclusion of policies to allow a postdoc not to lose eligibility due to parenthood or other well-justified leave creates equity and inclusivity for potentially vulnerable researchers. This flexibility should be available for all NIGMS training programs with timeline eligibility criteria.

How NIGMS-supported research training, career progression, or the educational program(s) listed above could be improved.

The National Postdoctoral Association recognizes and supports the continued effort of NIGMS to fund training grants and commitment to improving existing mechanisms. As an organization equally committed to training improvements, the NPA is appreciative of the opportunity to share the following areas of concern that are most relevant to postdoctoral career progression.
The NPA has classified six core competencies as critical skills for a successful postdoctoral training experience: (1) discipline-specific conceptual knowledge, (2) research skill development, (3) communication skills, (4) professionalism, (5) leadership and management skills, and (6) responsible conduct of research. The NPA recommends incorporating components of each core competency into their postdoctoral training programs, or connecting postdocs with resources (such as those provided by NPA) to obtain these competencies.

While the K awards are effective at transitioning postdocs to independent faculty research careers across a variety of scientific fields, there is concern that the K99 funded portion provides more value to the sponsoring PI than the applicant. The sponsoring PI benefits from the majority or entirety of the fellow’s salary/stipend paid by the K99, while the fellow’s budget for establishing their independent research program is roughly a third of that value. This generates a poor power dynamic and high reliance on the advisor’s research budget which can hinder the fellow’s progression toward independence and hinder the development of a strong and defined research plan that sufficiently diverges from their mentor’s research. The power imbalance could be improved by allocating a higher percentage of funding to the research budget rather than (or in addition to) stipend.

The current eligibility limitations on time passed post-graduation also hinder the ability of many postdoctoral researchers to prepare successful applications. The 4-year-post-degree cap on K99 applications is not in alignment with the difficulty and lengthy process of modern scientific discovery. It also disadvantages applicants who are from smaller institutions, training under early career investigators, or pursuing high-risk/high-reward projects.

NIH biosketches should be reimagined to reduce emphasis on the number and impact score of publications and consider their non-research skills and leadership capabilities, such as management skills, workshops/training completed, patents, and volunteer work. While publications are important for future success in research, the NIGMS should support and advise the Center for Scientific Review in their development of broader predictors to evaluate fellowship applications. The CSR has convened a working group to create the new criteria (assessing an applicant’s potential via the ‘delta’ model), and once instated, NIGMS should apply the improved criteria to any fellowship review panels it hosts outside of CSR.

Quality mentoring begins with the professional relationship between the mentor and mentee built on mutual respect and goes beyond scientific advising into career advice and suggestions for mentees to achieve success in their desired career path. Thus, this requires significant buy-in from postdoctoral advisors. Some universities supplement mentoring by offering training, classes, or career panels that address topics such as grant writing, interviewing for faculty positions, entrepreneurship, the transition to industry, and presentation and communication skills. However, these do not replace the benefits of one-on-one mentoring.

While a postdoc’s advisor should serve as their primary mentor, there is significant value in identifying external mentors that have broader expertise, especially in mentees’ desired career paths. To cultivate increased mentorship for postdocs beyond their advisors, the NIH and/or
NIGMS could curate and manage a database of quality mentors that applicants can connect with or communicate with. NIGMS can also require funded institutions to provide tangible evidence - provided in letters of institutional support and other funding documentation - for "postdoc access to diverse mentors outside of the primary advisor."

The career awards could also host webinars or seminar series in which a diverse group of program alumni talk about their career path and experiences, how they got where they are, pitfalls to be aware of, and the steps they took to establish themselves. Such a transfer of experience and point of view is an invaluable resource that not all postdocs may have access to within their institution or research network. In addition, NIH could provide peer networking opportunities such as regional gatherings for awardees and potential applicants hosted at designated institutions.

Foreign-born scholars are an essential component of the American research enterprise, constituting 50% to 75% percent of STEM graduate students and 50% of the doctoral-level science workforce. However, there continues to be a lack of funding opportunities for highly-skilled non-citizen scientists. The NPA encourages the NIGMS to expand opportunities or eligibility for non-citizens to compete for fellowships, similar to what has been done with K99/R00 or R01 awards. We hope the NIGMS is also willing to explore novel ways to address this disparity for the betterment of science and generation of a robust workforce of quality investigators, perhaps, even offer a pathway to citizenship along with the award. This will likely require new, creative solutions rather than adjustments to existing funding mechanisms, but we believe there is great potential benefit in offering an array of funding mechanisms that support postdoctoral researchers from a variety of backgrounds and experiences.

Nearly 60% of today’s PhD biomedical scientists pursue careers outside of academia. Training programs should do more to prepare scientists with non-technical skill sets that can be applied in a broad array of careers. The current training programs create very competent research scientists, but trainees would be better prepared to apply their research skills if they also had formal training in managerial skills, project management, conflict resolution, and other soft skills. Notably, the NPA has been filling the current gap in this area with our SmartSkills series which is the most successful and subscribed (835 professionals as of May 2022) program in the NPA’s 20-year history.

To truly expand training opportunities for the wide diversity of careers held by modern biomedical Ph.D. holders, training programs should provide opportunities for trainees to explore, experience and network within their interested career pathways. Not only will this give them formal experience and a professional network to better facilitate their success in the non-academic job market, but it also gives trainees a ‘test-run’ along any given “track” which would increase confidence in career decision making and increase retention in these careers. In 2013-2019, the NIH BEST program had been largely successful in establishing institutional programs to facilitate trainees’ pursuit of experiential training opportunities. The NIGMS should consider reauthorizing the BEST program to expand these opportunities to more students and postdocs across the nation.
Any areas of concern regarding the broader training environment and how NIH/NIGMS programs could help improve it.

It could be argued that postdocs are the most vulnerable population of researchers. They do not have uniform policies across funding agencies or institutions where they work, and their appointments are limited in length. They may or may not be considered employees, and depending on their funding source, they may not be offered any benefits as part of their contract. Having equitable benefits and compensation that align with their technical skills and high level of education would vastly improve the broader training environment and the quality of life for postdocs. This should include not only medical benefits but also dental, retirement, disability, vacation/sick leave, holidays, family leave, childcare access, and other benefits that are offered to institutional employees.

The NPA community has concerns about the quality of mentorship and training that postdocs receive from their advisors and their institutions. Postdoctoral experiences and perceived environmental support vary widely depending on the individual, lab, advisor, department, and institution. One way to create more consistency in postdoctoral training and mentorship at the advisory level is to provide mentoring training programs for NIGMS-funded investigators. A program like this could positively impact the overall experience of a postdoc by ensuring advisors have the knowledge and tools to mentor for a wider breadth of careers and in a culturally competent fashion. The overall landscape of research would also benefit from increasing the value of the mentorship in NIGMS-funded labs by cultivating better training environments which lends to better research outcomes in terms of productivity.

The ways in which trainees at your institution have worked to improve research training, career progression, or the educational environment.

Trainee-driven initiatives are often motivated by the needs of trainees themselves to fill gaps in their training and knowledge. Success of these partnerships are elevated by partnerships with faculty, departments, administration, and federal institutions to amplify the value and benefit of these initiatives. NIGMS is in a unique position to model trainee-driven initiatives that can eventually be emulated in other NIH institutions.

Mentoring cohorts provide a unique method of creating supportive environments for trainees. Established leaders in the field(s) of interest can provide an organizational framework and senior-level wisdom for trainees. Peer-to-peer support derived from these cohorts offers a safe place for trainees to seek guidance and share their everyday successes. In fact, the MOSAIC K99/R00 award already provides a framework for the concept of a mentoring cohort. Similarly, the American Society for Pharmacology and Experimental Therapeutics created a “Mentoring Network” supporting the establishment of mentoring cohorts for graduate student and postdoctoral researchers. Each group was led by a mid to senior-level mentor who facilitated monthly discussions on professional development topics chosen by the cohort. A publication at this link highlights the success of this type of mentoring cohort.
Similar to mentoring cohorts, the creation of working groups can bring like-minded trainees together for discussion centered on exploring different career paths. One method is to suggest each individual pick a career path of interest to them and have them conduct informational interviews with professionals in that field. The information is then presented back to the cohort, allowing for dynamic discussion of the different career paths that are available.

Funding is critical for the success of creating resources for trainees. NIGMS can provide funding to universities and research institutes to support professional development efforts of postdocs. First, salary support of a postdoctoral director would create a centralized, stable resource for postdocs seeking career development opportunities to supplement their research training and efforts. A director would have the ability to respond to the needs of postdocs on their campus and would be able to champion for additional administrative support from their university. Second, financial support for postdoctoral associations would allow for postdocs to develop skills that are valuable for the next phase of their career. The activities and programs created and executed by postdoctoral associations create valuable experiences that are essential for demonstrating competency to future employers. Creating grant opportunities for postdoctoral associations would also help build their grant writing skills in addition to the programs and projects they propose.

**Recommendations for how best NIH/NIGMS can receive feedback on trainee experiences going forward.**

An effective way to get feedback from NIGMS training programs would be to require an entrance and exit interview of all trainees that enter/exit NIGMS training programs. This would provide more candid responses at the end of the program because there is no fear of retaliation, and the NIGMS could broadly assess the aspects that worked and did not work across a variety of factors. The NPA supports the establishment of a standardized exit survey, and recommends the NIGMS include Likert-style scoring and narratives addressing quality of individual mentoring, overall quality of training, and description of the position for which the postdoc is departing.

To collect feedback from active trainees in NIGMS training programs, the NPA also suggests offering listening sessions between NIGMS trainees and NIGMS staff at established points throughout the postdoctoral period to assess what is currently working well and identify areas of concern. Communication of the dates, times and locations of these sessions well in advance to accommodate the schedules of all trainees, especially those meeting additional needs outside of work (e.g. families with young children), is essential. This environment would provide more comfort to trainees to share their experiences without a written recording to mollify any fears of retaliation held by trainees. It would also facilitate diverse perspectives to coalesce into identifying common barriers and direct potential solutions. Lastly, it has the potential to build more trust between trainees and NIGMS and fortify more direct channels of communication as the listening sessions recur over time.
We also encourage the NIGMS to partner with the NPA to assist or consult in the development of any new professional development or career training programs for postdocs. This would allow the NPA to illustrate the current needs of postdocs and allow the NIGMS to utilize our years of experience in providing career development resources to postdocs.