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The American Society for Biochemistry and Molecular Biology is an international nonprofit scientific and educational organization that represents more than 12,000 students, researchers, educators and industry professionals. The ASBMB strongly advocates for strengthening the science, technology, engineering and mathematics workforce, supporting sustainable funding for the American research enterprise, and ensuring diversity, equity and inclusion in STEM.

The National Institute of General Medical Sciences published a request for information, titled, “[Inviting Biomedical Research Trainee Input on Initiatives that Improve Research Training, Career Progression, or the Educational Environment in the Biomedical Research Enterprise](#)” on April 12, 2022, seeking feedback on initiatives that can improve research training, career progression or educational environments.

The ASBMB public affairs department has worked closely with members funded by NIGMS and with the Public Affairs Advisory Committee to provide the following comments and recommendations according to the provided prompts in the RFI.

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

**Transparency in program data**

The ASBMB applauds NIGMS for publishing its available data on training and diversity programs. These efforts not only hold NIGMS accountable to its goals but also share success stories and learning opportunities for the entire research enterprise. More institutes should mirror the efforts of NIGMS to be transparent in program evaluation using consistent metrics.

**Training opportunities for outstanding trainees, especially from historically marginalized groups**

The ASBMB is highly supportive of all NIGMS training programs that help retain, inspire and cultivate the next generation of scientists. In particular, T32s, F31s, F32s play a fundamental role in funding the training of predoctoral and postdoctoral scholars, and continued sustainable funding for these programs is crucial. The Minority Access to Research Careers programs are also worthy of praise for supporting the retention of underrepresented groups during undergraduate training, a period when many individuals exit the STEM pipeline.

**IRACDA programs**

Another great program for reinforcing the retention of individuals underrepresented in science, at the postdoctoral level, is the Institutional Research and Academic Career Development Awards program. For decades, this program has helped to bridge promising graduate students to academic faculty positions with great success. The aspects of this program that are particularly effective are the cohort structure, which provides internal support, and the partnerships with other local institutions, which provide external support while also boosting STEM at these partnering institutions. Unfortunately, flat budgets and increased costs of training and higher stipends have reduced resources and slots for IRACDA programs across the nation. The ASBMB hopes to see more resources dedicated to the IRACDA program.

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

**Cultivating mentoring relationships for trainee success**

Training and mentoring are not synonymous, and trainees who receive both have increased potential for success. Training is defined as developing skills needed to complete a task independently, while mentoring is a relationship whereby the mentor counsels, guides and supports their mentee toward achieving professional success. The [Guide to Mentoring and Training in the Intramural Research Program at NIH](#) states, “Research supervisors should always be mentors; they have the responsibility to discuss with and advise a trainee on aspects of his or her work and professional development.”

Furthermore, National Institutes of Health conducts annual training and mentorship evaluations that are mandatory to ensure compliance. Yet, there is no equivalent policy or enforcement for extramural researcher investigators. The ASBMB recommends that NIGMS require sponsors to develop and execute a mentorship plan that is unique and divergent from a training plan. These mentorship plans should be individualized to the career goals for each of their trainees and extend throughout the duration of their training. The plan and subsequent achievements or modifications in career interests should be reported annually in progress reports. A survey of ASBMB members indicated that 72% of respondents approved or strongly approved of NIGMS requiring a mentorship plan with all its trainees that extends throughout the duration of their training.

**Reduce administrative burdens on T32 awards**

Ruth L. Kirschstein Institutional National Research Service Award, or T32, programs are extremely valuable to the students who are funded by them but create an administrative burden on the supervising and administering faculty. Applications and reports for T32 programs can result in 400- to 650-page documents that place unrealistic demands on reviewers to provide a thorough assessment. Furthermore, the institution does not incentivize these awards due to the lack of indirect funds and low or no percent effort allowed. This makes it difficult for faculty to manage these awards on top of existing duties, i.e., running their own research labs and participating in teaching and service. The ASBMB recommends that NIGMS provides salary and fringe costs associated with a given percent effort for T32 principal investigators. We also recommend a consolidation and/or simplification of the number of forms required for staff and faculty to complete to better align PI percent effort with application requirements and the ability of reviewers to adequately judge content. To further reduce administrative burden, NIGMS could consider allowing flexibility in the program budget to fund a full or partial administrative staff position to assist in program management and preparation of program materials.

**Provide resources for T32 program evaluations**

Evaluation of T32 programs is also emphasized by NIH as a scored criterion for T32 training grants. NIGMS has previously stated it intends to take responsibility for developing an evaluation tool and/or evaluation guidelines that could be used by training programs. However, NIGMS does not yet have these tools available, nor does it provide any funding for the mandated evaluation. Until these resources can be made available, the ASBMB requests that NIGMS develop a template that would help standardize evaluations but still contain some flexibility for individual programs to customize to their individual needs.

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

### **Highlighting alumni**

A strategy used by some institutions to develop stronger institutional loyalty and assist in career development is engaging alumni to share their stories and careers. This effort facilitates a stronger network of alumni scientists that can be utilized by current trainees to explore diverse careers in a safe space. Additionally, alumni stories are potentially more impactful than general career panels due to their connection to the university and increased likelihood that students are aware of available resources.

### **Other examples from ASBMB and our members**

A survey conducted by ASBMB indicated that trainees and/or institutions have hosted seminars and webinars and create affinity groups and other programs to provide for research training.

A member of the ASBMB Public Affairs Advisory Committee indicated that the University of Massachusetts uses IDPs to integrate trainees' career development into their training. This is already [well-supported and/or required by NIGMS](#) and should continue to be supported and modernized as the needs of the workforce shift in response to COVID-19.

A member of the ASBMB Public Affairs Advisory Committee indicated that the University of Pittsburgh has trainees “coordinate book clubs on DEI initiatives and coordinate and run ‘alternate’ career forums and provide outreach to the community at local museums, etc.”

A survey respondent indicated they helped establish a [Childbirth Accommodation Policy for Students](#) that protects graduate students' rights to six weeks of parental leave, including birth, adoption and child placement via foster care, regardless of gender and marital status.

The ASBMB also provides resources for trainees' professional development, such as career symposia, networking events, implicit bias workshops and a science communication certificate program.

#### **4. Any areas of concern regarding the broader training environment and how NIH/NIGMS could help improve it:**

##### **Preparing trainees for diverse research and research-supportive careers**

[More than 60% of Ph.D. scientists](#) pursue careers outside of academia. With a majority of researchers diverging from academia, there is a strong need for trainees to receive additional and focused opportunities for career exploration, such as industry research bridge programs or other career externships. Indeed, more than 60% of respondents in our survey responded “Yes” when asked if access to career exploration via experiential internships or externships outside of academia would benefit biomedical training and career readiness. Historically, the NIH Broadening Experiences in Scientific Training programs were highly successful in filling this gap for trainees to explore bioscience careers while still in training.

However, only 17 institutions were given the opportunity to develop BEST programs over a six-year period, and the programs are no longer supported by the NIH. The lack of continued investment in these programs 1) left newly launched programs scrambling to continue to fund broad training experiences and 2) failed in broadening the establishment of similarly successful programs at other institutions. The ASBMB supports reauthorization of the BEST programs, which would expand the creation of new programs at more institutions and leverage a broader impact going forward. The ASBMB also supports other mechanisms that connect trainees to experiences outside of academia, such as [grant supplements for nonacademic research internships](#), similar to what is offered by the National Science Foundation.

### **Facilitating the skill-development beyond the bench**

Whether a trainee pursues a career as an independent research faculty or an industry research position, most Ph.D. holders will find themselves responsible for navigating new responsibilities outside of research experiments. The development of auxiliary skills away from the bench is important for all professional science careers and should be better supported and emphasized in training programs. The ASBMB encourages NIGMS to consider providing recurring workshops on skills that are essential for professional success beyond the bench, such as strategic planning, proper data storage, personnel management, conflict resolution, resiliency, utilizing constructive criticism, negotiation strategies and budgeting.

### **The complexity of the modern staff scientist and research scientist positions**

The staff scientist career path is currently stigmatized as one of stagnation while also being exploited to keep postdocs longer than the allowed duration without the benefits of being faculty. This poses a dynamic issue for the research enterprise. The benefits of destigmatizing these positions and making it more attractive for labs to staff them include increased stability in the academic research workforce, reduced reliance on trainees to produce data, and stable rewarding careers in which Ph.D. holders can utilize their specific skill sets. However, the [boom and bust cycle](#) in modern research funding renders the model of staff scientists unrealistic for the majority of academic research labs. Additionally, many early-career scientists have become stuck in this area between postdoc and faculty and cannot be supported by most funding agencies. Given the broad interest and impact of this topic within the biomedical research community, the ASBMB recommends that NIGMS dedicate resources to better understand the problem and explore potential solutions.

### **Financial barriers are damaging the next generation of scientists**

When asked “Have you (or others you know) experienced a reduced quality of life due to financial restraints during your NIGMS training program?,” 36% of survey respondents answered “Yes,” suggesting that a significant portion of trainees are struggling financially during their training. Recently, the National Science Board released [a one-pager](#) highlighting the fact that historically marginalized groups in STEM are disproportionately affected by financial burdens. For example, women hold 49% more educational debt than men, and Black doctoral recipients hold more than twice as much debt as white doctoral recipients. In [a Nature article this week](#), current stipends of biological science PhD students were shown to “fall well below the basic cost of living at almost every institution and department in the United States.” Financial burdens also are a primary contributor to mental distress that has been increasingly prevalent in the biomedical research community. The ASBMB encourages the NIGMS to consider taking action to alleviate financial burdens for research trainees so they can continue to thrive in their training programs, such as higher stipends and more equitable access to benefits.

### **More support for international trainees and scholars**

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](#). Foreign-born Ph.D. students and postdocs are often ineligible for training support and face limited career opportunities due to their visa status. While the NIGMS does provide opportunities to noncitizens via the K99/R00 pathway, most noncitizen trainees are ineligible for training grants. The NIGMS should consider creating some flexibility in their programs so international scholars can compete for at least a percentage of awards.

### **More on improving STEM training**

The ASBMB further directs the NIGMS/NIH to the thoughtful recommendations posed by the National Academies of Sciences, Engineering, and Medicine report, [“Graduate STEM Education for the 21st](#)

Century.” This report summarizes what constitutes an “ideal” graduate education and suggests steps toward materializing the ideal education, training and mentoring of the next generation of scientists.

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

**Establish NIGMS-issued feedback and climate survey**

To collect candid feedback from trainees in NIH/NIGMS programs, the ASBMB encourages the development of a *mandatory* anonymous climate survey facilitated by NIGMS annually. While many programs offer program feedback through surveys conducted at the institutional level, they may not be garnering honest feedback from participants. Many trainees taking “anonymous” institutional surveys are still easily identifiable due to limited numbers of trainees in the programs and/or identities. For example, if there are only five trainees at an institution with an F31, they can easily be identified when broken down by department and length in the program alone. These trainees may provide falsely positive evaluations due to fear of retaliation. Therefore, an anonymous survey conducted by the NIGMS will facilitate more candid evaluations at the end of each year, with the added benefit of creating consistency in all evaluations for better data analysis. Eighty percent of ASBMB members who completed our survey approved of a mandatory annual survey from NIGMS to track trainee progress.

For further questions or discussion, please contact Sarina Neote, Director of Public Affairs, at [publicaffairs@asbmb.org](mailto:publicaffairs@asbmb.org).