NINDS Strategic Planning Discussion Panel

Training and Diversity Panel Meeting Summary
Basic Science Faculty

September 22, 2020

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Introduction

The purpose of this discussion group was to give professors of neurosciences that primarily train academic (PhD) scientists a voice in defining the challenges and opportunities for training and diversity that NINDS will address over the next 5- to 10-year period.

Approximately 40 people attended the meeting, including NINDS staff members. Dr. Nina Schor, Deputy Director of NINDS, opened the meeting by describing the NINDS Strategic Planning Discussion Group series. The NINDS Leadership has formed taskforces designed to identify operational objectives that will enable NINDS to fulfill its overall mission. Among these taskforces is a group dedicated to identifying actionable areas of improvement toward NINDS' goal to "be a model of excellence for funding and conducting neuroscience research training and career development programs and ensuring a vibrant, talented, and diverse neuroscience workforce." Dr. Stephen Korn then introduced issues within the areas of scientific training, rigor, and mentorship that faculty members were encouraged to address in their discussion. Finally, Dr. Michelle Jones-London outlined ongoing efforts by the NINDS Office of Programs to Enhance Neuroscience Workforce Diversity (OPEN) to address diversity and inclusion among neuroscience trainees and faculty to facilitate the group's discussion.

Scientific Training

Faculty were given the following prompt for discussion on scientific training and rigor: How can NINDS facilitate stronger training in the principles of rigorous research, experimental design, quantitative literacy and analytical techniques and responsible conduct in research?

Formal Training for Trainees and Mentors
Faculty agreed that the need for training improvements in the areas of scientific rigor, quantitative literacy, and experimental design is not new; several believed their own training in these areas was either lacking or no longer consistent with current statistical or experimental practices. The group also acknowledged that poor training in these areas is a certain contributor to the reproducibility crisis in science, because poorly designed experiments and misused statistical analyses obfuscate meaningful and replicable results. As such, there was consensus that more resources on these topics are critical to neuroscience training, and not only for current trainees; mentors would also benefit from refresher course requirements.

The panel suggested that NINDS work to make available a uniform set of resources on rigor, quantitative analysis, and experimental design—similar to the webinars on rigor and reproducibility available from the Society for Neuroscience, who could perhaps become a partner in this endeavor. These resources could take the format of a lecture series from distinguished scientists that are known for their commitment to rigorous science. The panel further noted that in this new era of mainstream remote presentations and meetings, NINDS can facilitate events in which neuroscientists can learn from each other, and an enduring catalog of presentations may be simply recorded for future use. Once these resources are widely available, individual programs can establish requirements for their use.

The faculty members recognized that the increasingly multidisciplinary nature of neuroscience presents a challenge for developing a uniform set of resources on the concept of rigor, and that the utility of any given principle is determined by the context of a trainee's research. The group reached a consensus that training should be rooted in basic principles that will allow them to think critically and identify problems readily, rather that requiring a topflight statistics course that teaches more detailed equations and methods. Faculty believed that when it comes to quantitative analysis, "if you don't use it you lose it," and in these cases collaboration can be pursued for skills that are not regularly performed by that trainee as long as they know enough to pursue that collaboration. Faculty believed that teaching basic principles should apply to computer programming skills as well, so that even a strict biologist who does not need to become a computer scientist will have basic literacy in this sort of quantitative analysis.

Incentivizing Scientific Rigor

The faculty acknowledged that while introducing resources and requirements may help improve scientific rigor, it must also be incentivized if a true "culture of excellence" is to emerge. There was support for making rigor and reproducibility statements a separate, lengthier component of grant applications (like current sections on responsible conduct of research), as well as for incorporating assessments of rigor into progress reports. However, these efforts do not guarantee that people will not simply pay lip service to the requirements without honoring their submissions.

The onus of driving this culture shift should not rest on trainees, who will face difficulty implementing new rigorous methodologies into established lab environments no matter how well trained they are; some faculty suggested that thesis committee meetings in which the advisor exits the room could be an opportunity to identify labs that are not complying with rigorous standards and hold them accountable, although this is contingent on trainee's feeling comfortable enough to speak up. Some of this resistance may arise from the fact that introducing stricter statistical analysis will inherently lead to more null results, which are not encouraged by current incentives (e.g., the "publish or perish" mentality that pervades academia). Faculty emphasized that publication of null results must be normalized to facilitate widespread adoption of more rigorous scientific methods and analysis. Some faculty believed that pre-registration of experiments with journals simultaneously encourage more rigorous experimental design and may solve this incentive problem, because publication is virtually guaranteed even if null results are produced; other faculty balked at this idea, citing special difficulty in pre-registering exploratory projects.

Mentorship

Faculty were given the following prompt for discussion on mentorship of neuroscience trainees: What could NINDS do to facilitate better mentorship?

Formal Training

Faculty stated that there are three broad categories of mentors: good mentors, poor mentors, and toxic mentors. While toxic mentors should be avoided as a general rule, poor mentors improve through formal mentorship training. Indeed, the group believed that even good mentors should take refresher courses to maintain high mentorship standards.

Similar to existing NIH and NINDS training requirements (e.g., responsible conduct of research), the faculty suggested that NINDS create a set of universal mentorship core competencies for which training is required of any scientist (at any career stage) with an NIH-funded trainee. A centralized effort by NINDS to establish these expectations would improve upon what one faculty member described as the "shotgun approach" to mentorship training that institutions currently employ, in which an inconsistent set of mentorship courses offered from different sources are required to varying degrees in a patchwork fashion across programs.

The group indicated that formal training in effective use of individual development plans (IDPs) should be an essential aspect of mentorship training. Although many programs currently require trainees to complete an IDP and share it with their mentors, often the trainee and mentor dyad do not follow up on the IDP and use it productively; for example, mentors and trainees can learn how to use the IDP to outline actionable and attainable—rather than merely aspirational—goals. The IDP should be a flexible document that evolves as the trainee's career goals evolve, and mentors should understand how the IDP can assist them with the necessary task of providing individualized mentorship for their trainees.

Accountability

Although the faculty agreed that most scientists generally *want* to be good mentors to their trainees, persistently inadequate or even toxic mentors still exist and should be held accountable. This accountability can begin with emphasizing the value that the community places on mentorship by including explicit mentoring statements on fellowship training plans or supplements. Mentorship sections can also be required on biosketches, in which information on past trainee outcomes and publication records is readily obtainable by potential future trainees prior to lab selection. Care must be taken, however, not to introduce bias against junior faculty into evaluation processes, because their mentorship track records are inherently more limited.

One faculty member suggested that academia adopt an "information escrow" system for holding poor mentors accountable. The "information escrow" concept is already employed in business and law professions, and within that framework a trainee could lodge a complaint against a mentor without the institution taking immediate action and creating a disruptive mentor-mentee dynamic. The complaint would be saved but sealed until the mentor receives a threshold number of complaints (as determined by the institution or NIH), at which point an investigation into this pattern of poor mentorship can be triggered. This "information escrow" format received some support from the faculty, who noted that it would be beneficial for general mentorship concerns as well as more serious problems, such as sexual harassment or racist behavior. Faculty noted that although it would be preferable for institutions to handle such investigations, the community must be cognizant of the fact that some institutions may be inclined to shield well-funded scientists from retribution.

Diversity and Inclusion

Faculty were given the following prompt for discussion on diversity and inclusion in the neuroscience workforce: What are the programs and policies that NINDS could implement to promote diversity, inclusivity, and cultural competence? How do we communicate and foster the value of diversity across all programs and career stages?

Mentorship Training and Reporting Requirements
The predominant theme of the group's discussion was that good mentorship is at the heart of building a more inclusive climate for a diverse neuroscience workforce. Mentors should be trained in best mentorship practices as well as explicitly trained in matters of cultural awareness; this training should occur not once, but rather on a continuous basis with refresher courses. NINDS can also facilitate networking opportunities for underrepresented minority (URM) trainees to identify new mentors at various career stages.

Reporting requirements can be created that will explicitly identify institutions that are or are not making an honest effort to train their mentors and build an inclusive environment. In addition, progress reports for trainees on R-mechanism diversity supplements can be expanded to require a report from the trainee, because the mentor's perspective on training progress may differ from the trainee's reality and contribute to attrition of these trainees at later stages. Support was also expressed for the creation of a diversity F32 mechanism. The group also noted that more diverse reviewer pools may place more emphasis on these requirements, ultimately contributing to a culture shift.

Preparation for Career Transitions
The group expressed that preparing trainees for important career transitions—whether from undergraduate to graduate school or postdoc to junior faculty position—is a vital aspect of diversity and inclusivity efforts. To that end, several faculty members expressed support for NINDS to develop a post-baccalaureate program that would support URM students who want to attend graduate school.

Several faculty also acknowledged that in order to attract URMs to PhD programs, tenure track academic careers should not be advertised as the central goal for all trainees, because URM trainees may be more likely to desire scientific training that will prepare them for careers outside of academia given the current lack of representation within academia. Furthermore, once URM trainees enter graduate school, they should not be penalized on grant applications for not having a fully developed career plan early in training. This problem is experienced by all graduate students but is exacerbated for those in underrepresented groups, and faculty believed that NINDS should explicitly advise mentors that trainees who find success in non-academic careers will not reflect badly upon them in any way.

Faculty also supported greater attention to monitoring the career outcomes for URM trainees at various stages as a way to gather data regarding when and why they may choose to leave academia. Furthermore, one faculty member suggested that a re-entry point could also be identified for trainees who decided to leave academia but would like to return. One way for mentors track URM trainees' career progress is to encourage the trainees to list their personal email addresses (rather than temporary university email addresses) on databases such as eRA Commons.

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