NINDS Strategic Planning Discussion Panel

Training and Diversity Panel Meeting Summary
Clinical Faculty

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Table of Contents

Introduction 2
Scientific Training and Rigor 2
- **Centralized Training** 2
- **Training the Mentors** 3

Mentorship 3
- **Identification of Good Mentorship** 3
- **Formal Training and Accountability** 4
- **Pathways to Independence** 4

Diversity and Inclusion 5
- **Representation and Mentorship** 5
- **Financial Disparities and Delayed Exposure to Opportunity** 6
- **Long-Term Investment** 6

Introduction

The purpose of this discussion group was to give professors of neurosciences who primarily train clinician 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 and Rigor

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?

Centralized Training

The group recognized that the need for more training in scientific rigor, experimental design, and quantitative literacy is not new; one faculty member expressed that the absence of formal training in these areas leads to the education of technicians rather than scientists. However, the group also recognized that acquisition of this training is not enforced in a meaningful way. There was strong support for NIH-supported centralized training in these areas (e.g., an NIH-sponsored seminar series), which would make instruction available to scientists at institutions that do not have the resources to provide courses locally. Faculty emphasized that a centralized training program should be broad enough to be applicable to multiple fields within neuroscience. In addition, even remote training programs should include opportunities for students to discuss the material with peers in order to promote effective learning; however, centralized assessment (albeit not necessarily for a grade) would be important to monitor the success of such a program, and faculty underscored the importance of developing metrics to assess scientific rigor.

Much of the discussion centered on *how* such training would be implemented in a culture that has de-emphasized taking time for coursework. Training in these areas can be facilitated through grant mechanisms that do not rely on courses: for example, funding for statisticians to educate trainees obtained through T32 grants is an effective way to introduce and encourage these training opportunities within graduate programs. In addition, funding for medical students to spend a year in a

laboratory to immerse themselves in these concepts may incentivize greater attention to developing scientific rigor during training as a clinician scientist.

Training the Mentors

The faculty acknowledged that even mentors have widely variable backgrounds in scientific rigor, experimental design, and quantitative literacy; clinician scientists in particular face a unique challenge because they may not have had the same exposure to these experimental principles as their PhD colleagues. Therefore, mentors and mentees alike would benefit from mentors that also participate in this formal training. One faculty member commented that an added benefit of mentors and mentees taking such courses together could be a sense of camaraderie derived from the shared experience.

Faculty acknowledged that the ability for mentors to devote time to this sort of training varies by institution, and that some institutions may not offer courses. These hurdles could be partially addressed by a centralized training program. Parallel training of mentors and mentees could become a requirement of F and K award mechanisms, and a broader clinical requirement to understand scientific rigor—similar to existing requirements related to ethics or vertebrate research—could also be formalized through a standard NIH examination. The group noted that the ability for NINDS to make formal training or certifications a requirement for funding opportunities is limited; however, NINDS could encourage institutions to make training a pre-requisite for earning institutional approval of grant submissions.

Mentorship

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

Identification of Good Mentorship

Faculty identified two primarily characteristics of poor mentorship: neglectfulness and toxicity. The group generally identified neglectful mentors as more common and having potential to improve, whereas toxic mentors were viewed as less common and should be avoided by trainees altogether.

Several of the group's suggestions to improve mentorship centered on enabling trainees to identify good mentors more readily. To accomplish this, the qualities of good mentorship can be enumerated by quantifiable metrics that can be shared with trainees; one faculty member shared that such a transparent rating system is already in place at their institution to help trainees find better mentors. Although institutions can adopt these rating systems on an individual basis, the neuroscience community as a whole would benefit if it collaborated on the metrics that should be included in such a system. NINDS can facilitate the creation of a set of mentorship core competencies, evaluation metrics, and best practices by hosting discussions with members of the community much like this one. Faculty added that there should be an explicit requirement for mentors to dedicate time to train their mentees in the areas of scientific rigor and reproducibility.

Faculty generally agreed that involving more people in mentorship would help trainees to find good mentors. These valuable inputs can be leveraged at multiple points in training, including before a mentor is even established. For example, institutions can appoint someone to guide trainees through

the lab selection process to help ensure alignment of goals between mentor and mentee; this may be especially helpful for clinician scientist trainees, who are often less integrated into the research community than PhD students and may be less able to identify a good or bad mentor by reputation. Once the lab has been chosen, creating a formal mentorship team—rather than relying on the PI as sole mentor—will maximize the trainee's opportunity to find the kind of guidance that will be most beneficial. Mentorship teams often exist informally as a matter of course; formal mentorship teams would normalize the inclusion of junior scientists in mentorship roles, providing valuable perspective and often increased mentor availability for trainees as well as hands-on mentorship training for the more junior mentors. Progress reports that solicit input from multiple people will also help to ensure honesty and transparency regarding the quality of mentorship provided.

Formal Training and Accountability

Faculty generally agreed that mentorship training should begin early in a scientist's career. Not only will this groom better mentors for trainees, but also it establishes a track record of good mentorship that will help scientists on future grant proposals. This formally recognized training could come from participation on mentorship teams or through mentorship training programs.

To improve the quality of mentorship in the neuroscience community as a whole, faculty suggested a nationwide NIH-curated mentoring program for both mentors and mentees; senior mentors would learn mentorship skills, while mentees would learn skills for success as a trainee as well as begin the process of learning to become good mentors themselves. Such a training course could leverage existing programming from Clinical & Translational Science Institutes (CTSIs) while setting a standard set of expectations on a national level. A centralized course also makes this training available to mentors even if their home institutions have no such offering.

In addition to training requirements for mentors, faculty expressed a desire to hold mentors accountable for blatant examples of neglectful behavior toward mentees; specifically, the group supported explicit guidance that letters of support obviously written by the trainee— instead of the mentor—should result in a penalty. Mentorship effort and quality could also be added as an explicit evaluation section for funding applications and constitute a required section of progress reports.

Pathways to Independence

As one faculty member stated, successful trainees are the "legacy" of good scientists. Thus, a critical aspect of mentorship is setting up trainees with a pathway to independence.

The group noted that clinician scientists may have difficulty establishing independent laboratories if their goals are not aligned with those of their mentor. For example, a breakdown in communication may result in a trainee reaching the end of their training without resources that they can take to their next position; faculty stated that K awards should be designed with independence in mind, and this consideration is among the reasons that NINDS will not accept K award applications in which the aims overlap substantially with the mentor's aims.

Faculty supported formal evaluations of mentor and mentee goals to ensure alignment in this important training relationship. Alignment may take the form of an explicit contract that sets expectations for both the mentor and the mentee, as well as delineates what resources and outputs

will belong to whom at the completion of training. Faculty also supported formal check-ins with NIH during the first and fifth years of training to discuss these expectations and upcoming transitions; these check-ins can occur virtually to reduce cost.

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?

Representation and Mentorship

Discussion on the topic of diversity and inclusion in the neuroscience workforce focused primarily in two areas: recruitment and retention of underrepresented minorities (URMs). Faculty acknowledged that numerous sources of disparities contribute to difficulty recruiting and retaining URMs in neuroscience and recognized that specific disparities must be addressed individually to improve diversity and inclusion as a whole. To that end, faculty believed that it is important to collect data on how unique disparities impact recruitment and retention of URMs and to continuously share these data to both emphasize the importance of diversity and inclusion as well as to provide actionable insight for the community at large.

One disparity highlighted in the discussion was representation: URMs often struggle to find a senior faculty mentor or role model with whom they can identify. This lack of representation contributes to difficulties gaining confidence as a scientist (e.g., heightened feelings of imposter syndrome) and feelings of isolation in the scientific community. Expanding the availability of URMs in the mentorship pool is therefore critical to creating an environment for early career URM scientists to thrive. Awards for the recruitment of more URM faculty will facilitate the expansion of the mentor pool and promote an inclusive culture shift.

Several centralized efforts to promote diversity and inclusion were suggested by faculty. Training in culturally sensitive communication and microaggressions, for example, can be required of mentors and mentees who receive NIH funding to promote this culture shift; tying this training to funding mechanisms will help to ensure that inclusivity is embraced in practice rather than in name only, which can occur when institutions are left to build more inclusive environments themselves. Faculty also suggested that NINDS invest in a national network of mentors that can be leveraged by trainees at institutions with few URMs in mentorship positions (similar to the National Research Mentoring Network [NRMN] or the Training in Research for Academic Neurologists to Sustain Careers and Enhance the Numbers of Diverse Scholars [TRANSCENDS] program). Such efforts can be supported by partnerships with institutions and scientific societies so that URM mentors are compensated for their expanded mentorship contributions without incurring a diversity tax (i.e., an increased burden of contributing to increasing diversity and inclusion efforts that subsequently takes time away from building their own careers).

Financial Disparities and Delayed Exposure to Opportunity

Faculty highlighted that financial disparities skew recruitment and retention of the neuroscience workforce toward more economically privileged groups. One faculty member described having an NIH-funded career as a "luxury" and that living in an expensive area on an NIH salary may not a viable career choice. These factors drive many young scientists, often disproportionately URMs, toward careers outside of academia even after they have completed rigorous training.

Faculty further noted that privilege often increases awareness of opportunities earlier in a scientist's career; as a result, requirements and eligibility timelines for grants and training program admissions could be adjusted to account for scientists who were exposed to these opportunities later in life. The group further acknowledged that diversity among clinician scientists may be enhanced by the fact that many medical students in general may not recognize clinical research as a career option. A protected period of time early in medical school for students to immerse themselves in research provides an opportunity for trainees to learn about neuroscience research (and perhaps even convert to an MSTP program) when they previously may not have been exposed to the opportunity.

Financial disparities and delayed exposure to opportunity exacerbate one another; for example, older trainees who entered a science field later in life are more likely to have families. Variation across training programs can have consequential differences regarding health insurance coverage for family members and impose undue financial burden on the trainee. Comprehensive health insurance coverage that includes families, as well as general salary increases, can lessen the impact of these financial disparities. In addition, distinct pay lines for URMs to receive grants that have differential success rates can help to equalize the funding landscape.

Long-Term Investment

If the neuroscience community is going to train *and maintain* a diverse workforce, inclusion efforts must be a long-term investment. The earlier that a trainee is exposed to opportunities in research (e.g., summer research programs), the easier it will be for that trainee to pursue a career in academic science.

Faculty acknowledged that although it is not squarely in the scope of NINDS' current efforts, it would be beneficial to identify and support students interested in neuroscience at earlier stages that would eventually become good candidates for existing NINDS early training programs, such as the Enhancing Neuroscience Diversity through Undergraduate Research Education Experiences (ENDURE) program. For example, both the National Institute of General Medical Sciences (NIGMS) and National Science Foundation (NSF) have support structures for high school students. NINDS could partner with institutions, scientific societies, and community outreach organizations to increase its availability to young URMs.

Career sponsorship programs, in which a mid-level or senior faculty member is paired with a young URM scientist early in their career, can also boost retention by providing long-term mentorship. Regular check-ins as these young scientists progress through each career stage may help to compensate for the mentorship disparities often experienced by URMs by providing individualized guidance that accommodates the specific needs of URMs in neuroscience. Dedicated career sponsors

can also help institutes such as NINDS identify how disparities intersect with different career stages and monitor career outcomes among URM scientists (e.g., by providing follow-ups on grant awardees who subsequently did not apply for the next stage grant), such that inclusion and diversity efforts can continuously improve based upon new insights.

Training and Diversity Panel Roster – Clinical Faculty

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