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NeuroView

NINDS Strategies for Enhancing the Diversity of Neuroscience Researchers

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Neuroscience is one of the fastest growing fields and highlights the excitement about research, but it also demonstrates the impact that our large scientific community can make in prioritizing equity and inclusion throughout science. I discuss strategies at multiple systemic levels where opportunities and interventions could be implemented to enhance neuroscience workforce diversity.

I write this as an African American female neuroscientist who, sadly, has too many of her own #Blackintheivory stories to tell. I choose to work in my purpose-driven federal career every day to make a difference by enhancing neuroscience workforce diversity at every level—and hopefully reducing the number of these stories and the collateral damage they represent. As a multidisciplinary science, [neuroscience is one of the fastest-growing fields for PhDs](#). This exponential growth highlights the excitement about research but also demonstrates the impact that our large scientific community could make in prioritizing equity and inclusion throughout the biomedical sciences. In this moment, we are called to focus as a community and confront the structural racism that has existed for too many years. What will we do with this moment? Will we rise to the challenge to bring our collective attention to dismantling structural biases and racism in the neuroscience workforce?

At the National Institutes of Health (NIH)'s National Institute of Neurological Disorders and Stroke (NINDS) and within the Office of Programs to Enhance Neuroscience Workforce Diversity (OPEN), my team is committed to supporting scientists from underrepresented groups through a [variety of programs](#). We work at the individual, institutional, and community level to open opportunities and access to enhance the diversity of the neuroscience workforce. We work within our institute and across the NIH (e.g., through the NIH Blueprint to Advance Neuroscience and the BRAIN Initiative)

to accomplish these goals. NINDS encourages all eligible scientists to explore and apply for these opportunities, some of which are highlighted below.

Our Strategy

The NINDS OPEN strategy for diversity and inclusion is to (1) identify diverse pools of students along the training pathway to recruit and prepare trainees, (2) provide resources for retaining diverse scientists and eliminating barriers for career transition, (3) develop meaningful mentorship and connect individuals to supportive scientific and professional development networks, and (4) develop policies and resources to enhance diversity in neuroscience. These diversity programs often provide more than just financial support and are an opportunity to create meaningful networks and supportive communities. It is important to note that these programs support meritorious and competitive awards that fulfill a mission-critical need for NIH. Programs that encourage diversity employ the same logic as NIH mechanisms that specifically solicit clinician researchers, translational investigators, and scientists with quantitative backgrounds. The programs are created to attract and support talented scientists who have historically faced systemic barriers leading to their underrepresentation in the biomedical sciences and whose participation in biomedical workforce will enhance innovation and creativity, problem solving, decision making, and many other aspects of science. Hopefully, the resources and funding opportunities offered by NINDS

will facilitate a small part of the solution for diversity and inclusion that enhances neuroscience workforce diversity. As a funder, we can contribute to and support the change, but we alone cannot make an impact.

Recruit and Prepare Trainees

The [Research Supplements to Promote Diversity](#) provide administrative supplements to existing NIH research grants (R-, P-, U-, etc.) to support the work of underrepresented scientists—from the level of high school students through early career faculty. Supplements provide funding for the mentee to gain research experience, preliminary data, and/or other requirements to develop an application for further training or more traditional NIH funding opportunities. Our graduate and postdoc supplementees have better than average success rates for subsequent awards, like the F31, F32, and K awards. An overwhelming majority of NINDS-supported diverse trainees stay in the general biomedical workforce after training (94%). The majority of former supplement trainees who have received their doctoral degree and have finished postgraduate training remain in either academic research or teaching (43%) or science-related non-research (40%).

On the institutional side, NINDS supports budding neuroscientists through the Research Education R25 mechanism. Our Summer Research Experience Programs, which are designed to help attract young students to careers in science, provide underrepresented high school or college students with authentic research

experiences during summer breaks and provide opportunities for college students to gain valuable experience in preparation for graduate school.

The ENDURE Program, another R25 program that is run through the [NIH Blueprint for Neuroscience](#), engages undergraduates from underrepresented groups in a 2-year neuroscience research program during the academic and summer months, starting in sophomore or junior year. Six awards encompass 40 neuroscience partner institutions, including host institutions, T32 partners, summer placement institutions, and external advisors. Each student averages 1,700 research hours upon completion of the program, and currently 60% of alumni are enrolled in post-graduate programs.

Support at Critical Career Transition Points

At each point on the academic ladder, the research workforce becomes less diverse ([Meyers et al., 2018](#); [Gibbs et al., 2016](#)). NINDS recognizes that career transitions are a natural time for reevaluation and that many trainees encounter barriers to advancing in academia at these critical times.

NINDS facilitates career transitions for individual researchers through the NIH Blueprint D-SPAN F99/K00 program and Mentored Career Development Awards (K awards). These awards provide protected time, mentorship, and resources to navigate the graduate school to postdoc, postdoc to faculty, and tenure track to tenure transitions. In all these awards, mentors must help researchers to navigate institutional expectations, scientific networks, and practices that are relevant to productivity and advancement at the institution.

The [NIH Blueprint D-SPAN F99/K00 Award](#) supports graduate students from across neuroscience with 1–2 years of funding to complete their PhD and 4 years of funding to take anywhere in the United States for their postdoctoral training. Although a relatively new program, it supports 59 scholars, 22 of whom have already transitioned to the postdoctoral level.

At the next career stage, the NINDS Diversity K22 Advanced Postdoctoral Career Transition Award has two phases:

(1) an initial mentored postdoctoral training period for 2–3 years to facilitate the development of independence and (2) support during the early stages of a faculty position. The goal is to diversify the pool of independent neuroscience research investigators and to enhance their probability of success in obtaining independent research support from NIH or elsewhere.

Finally, the NINDS Diversity K01 Faculty Development Award provides tenure-track junior faculty protected time (up to 5 years) and resources for exploring innovative ideas, collecting preliminary data, and successfully attracting external research funds with the goal of receiving tenure. NINDS K awardees have been markedly successful in competing for subsequent R01s and establishing their independent research programs.

Develop Meaningful Mentorship and Supportive Networks

NINDS recognizes that no trainee can thrive in isolation. As pointed out in the National Academy of Sciences 2011 Report on [Expanding Underrepresented Minority Participation](#), “even if trainees are prepared, have adequate information, and are ambitious and talented enough to succeed in STEM fields, success may also hinge on the extent to which students feel socially and intellectually integrated.” To that end, NINDS funds national programs targeted to mentorship, professional development, and the creation of networks/cohorts through the R25 mechanism. Two of these programs are managed by scientific societies ([Society for Neuroscience](#) and the [American Academy of Neurology](#)), while others (e.g., [BRAINS](#), [MINDS](#), and [COMRADE](#)) focus on the specific needs of postdocs and/or faculty across the United States. The longest running of these programs, SfN’s Neuroscience Scholars Program, has supported more than 700 diverse trainees over three decades.

An emphasis on mentorship and networking are also built into all of our programs; for example, D-SPAN and ENDURE scholars convene at annual meetings, while principal investigators (PIs) of our R25 programs convene with T32 PIs at regular meetings to build alliances with individuals who are actively engaged in addressing issues concerning

workforce diversity and individuals engaged in neuroscience training.

Examining Policies and Developing Resources

With the understanding that disparities are not just the result of individual actions, but primarily result from unjust policies, procedures, and systems, NINDS has also embarked on several initiatives to examine our existing systems to ensure that our decision making is fair and inclusive. Many of these initiatives stem from the NINDS Diversity Workgroup, in which staff from across the institute meet to discuss these issues and take action.

We have developed [resources](#): webinars, program-specific tip sheets, and a podcast, [Building Up the Nerve](#), to assist applicants in navigating what can be viewed as a confusing and daunting process with regards to grant application submission.

As outlined in a recent [Director’s Message by Dr. Walter Koroshetz](#), NINDS is also taking time to address racial bias in our own house and to address the consequences of racial bias on the science we fund. We are currently in the midst of a strategic planning process and would [encourage comments](#) regarding the topic of enhancing neuroscience workforce diversity.

What Can We Do to Promote Equity in Neuroscience?

As a scientific community, we can agree to move this conversation from “where is the diverse talent—does it exist?” to a focus on the ways that diversity helps solve many of the tough research questions within neuroscience. Research shows that diverse teams working together and capitalizing on innovative ideas and distinct perspectives outperform homogeneous teams ([Antonio et al., 2004](#); [Campbell et al., 2013](#); [Hong and Page, 2004](#)). Scientists and trainees from diverse backgrounds and with diverse life experiences bring different perspectives, creativity, and individual enterprise to address complex scientific problems. A diverse NIH-supported scientific workforce fosters scientific innovation ([Hofstra et al., 2020](#)), enhances global competitiveness, contributes to robust learning environments, improves the quality of the research, advances the

likelihood that underserved populations participate in and benefit from health research, and enhances public trust. Diversity and scientific excellence are not two separate concepts. We must enlist all the brightest minds and talents within our diverse research community and remove all barriers to advancement. However, increasing diversity alone is not sufficient. We must create inclusive environments that welcome and value everyone's contributions. I often quote Vernā Myers, "Diversity is being invited to the party; inclusion is being asked to dance."

There is a shared responsibility between NIH and the institutions that we fund. At the institutional level, senior leadership sets the tone. What gets measured gets done, and what gets rewarded gets repeated. Institutions must measure institutional climate and promote cultural awareness. It is necessary to attend to the intersectionality of race, ethnicity, disability status, sexual orientation, gender identity, and other marginalized identities (for example, panels for issues concerning women should not be made up only of white women). The diversity goals at the institutional level should be explicit and foster development of strategies to achieve those goals. When we think about diversity, we often focus on the impact on the individual. However, we should not lose sight of what diversity means to the larger lab, university, or research environment. Institutions must develop strategies to address unearned advantages and disadvantages.

As we deal with the COVID-19 pandemic and conversations regarding developing immunity to the virus, this makes me think in parallel about resistance or an immunity to change itself and what it takes to change the structural racism that clearly exists in the science and biomedical enterprise (Cell Editorial Team, 2020). Personal change is undeniably intertwined with organizational change. According to Robert Kegan and

Lisa Laskow Lahey, resistance to change is a "hidden commitment" created by individual beliefs and collective organizational mindsets, with an underlying root cause, that competes and conflicts with a stated commitment to change (Kegan and Lahey, 2009). "Immunity to Change" is a framework that tracks goals and focuses on overcoming perceived barriers and outlines productive actions to combat the forces of inertia. This framework could be useful as we transition from supportive statements to concrete action plans. Below is a summary of this leadership tool:

Step 1: A Commitment to Change. Get goal oriented and identify actions to achieve the goal.

Step 2: Behavior. What are you doing or not doing to support that commitment? How do we clear out obstructive behaviors?

Step 3: Hidden Competing Commitment. What is the hidden competing commitment? How do we confront competing commitments?

Step 4: Big Assumption. What is the underlying belief that underpins the hidden competing commitment, and how do you challenge assumptions?

At the individual level, we must work to ensure that we acknowledge the thoughts, feelings, perspectives, and ideas of our peers, especially those who are underrepresented. The data from several studies show that scientists from underrepresented groups typically receive less mentoring than their well-represented peers, and this can promote career attrition or limit career advancement. Each of us, individually, must practice meaningful mentorship and sponsorship. Sponsors connect mentees to "power" through award nominations and membership in professional networks. As scientists, we solve tough, complex research questions every day—confronting structural racism and increasing diver-

sity in the workforce should not be treated as "just too hard." As neuroscientists, we work to understand the power and wonder of the brain—it is time we use these brains to create long-lasting structural change. As funders, scientific communities, institutions, and individuals, we are the change we seek. And as William and Susan Bridges wrote in 1981, "It isn't the changes that do you in, it's the transitions. Change is situational, transition is the psychological process people go through to come to terms with the new situation. Change is external, transition is internal" (Bridges and Bridges, 1981).

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