

NIH Advisory Committee to the Director Working Group on Re-envisioning NIH-Supported Postdoctoral Training 2023 Virtual Public Listening Sessions

Introduction

Ensuring the future of United States competitiveness and innovation in biomedical research is of utmost importance to the National Institutes of Health (NIH). As a part of this effort, NIH endeavors to promote the well-being, diversity, and sustainability of the biomedical workforce. Postdoctoral researchers are one of the important groups within the biomedical workforce. However, the number of postdoctoral trainees in the U.S. has been declining since 2019 despite increasing graduate student enrollment and investment in biomedical research. In light of this trend, NIH established a working group of the Advisory Committee to the NIH Director (ACD) to specifically address growing concerns about the postdoctoral training system and academic research investigators' ability to recruit qualified postdoctoral candidates in the future. The goals of the working group are to explore the status of the postdoctoral training system, identify and understand critical factors and issues related to the decline in the number of postdoctoral fellows in academia, and provide recommendations to address those factors. In line with this endeavor, the working group organized four virtual public listening sessions to solicit input from the extramural biomedical community, each addressing one of the following four topics: role, duration, structure, and value of the academic postdoc, including impacts on underrepresented populations; international trainee concerns; compensation and benefits, including child and dependent care; and job security, career prospects, and quality of life. The sessions were open to the public and widely publicized to welcome a broad range of community input.

During each listening session, working group co-chairs Tara A. Schwetz, Ph.D., NIH Acting Principal Deputy Director, and Shelley Berger, Ph.D., Daniel S. Och University Professor and Director of the Epigenetics Institute at the University of Pennsylvania, provided an introduction to the working group's charge, the purpose of the sessions, and a summary of high-level data on the session topic to set the stage. Invited speakers from the biomedical community then identified chief challenges and recommendations before working group members facilitated an open discussion session, where all attendees were encouraged to share their comments and proposed solutions.

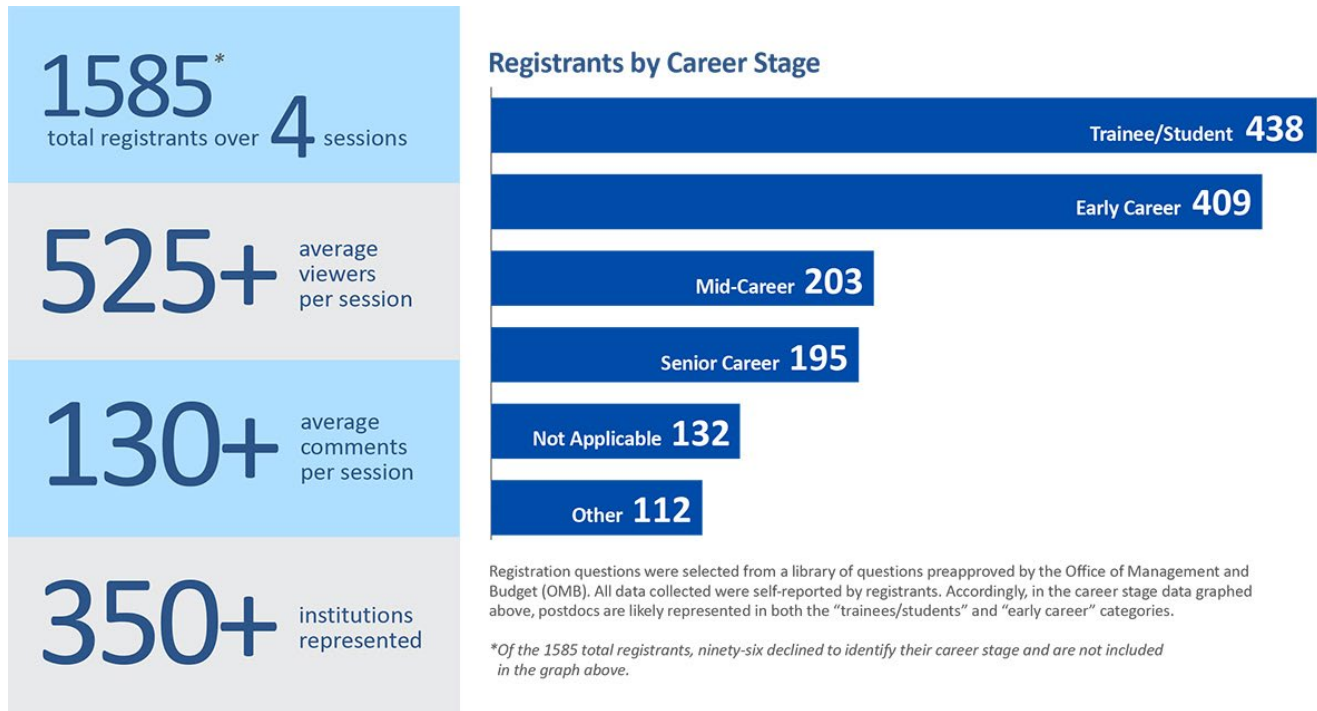


Figure 1. Summary of Participation in Virtual Public Sessions

The series attracted a total of 1,585 registrants from 31 countries and more than 350 institutions. The first session had the highest number of viewers (637), with 150 comments. Registrants self-reported their career stage, and most identified themselves as trainees/students (438) or early career (409). Postdocs are likely represented in both categories. Sessions were well attended, with an average of 525 viewers and 130 comments per session (Figure 1).

In this report, we provide a summary of each session and a synthesis of the themes and recommendations presented by invited speakers and participants from the broader biomedical community. The working group will use input from the sessions to inform their discussions and development of recommendations to improve the experience of postdoctoral researchers in the U.S.

Virtual Listening Sessions, Meeting 1
Wednesday, March 8, 2023, 12:30–1:30 p.m. ET

Key Takeaway and Overall Summary of Session 1: Role, Duration, Structure, and Value of the Academic Postdoc (Including Impacts on Underrepresented Populations)

Invited speakers and community commenters were aligned about areas of the postdoctoral experience that need improvement. The cross-cutting themes focused on the following areas:

- Increased financial support and benefits
- Equitable treatment by institutions
- Infrastructure changes in postdoc training
- Increased mentor accountability and oversight
- Clearer and more extensive career development opportunities for postdocs
- Providing meaningful training opportunities beyond academic or research-specific skills
- Providing more academic research positions beyond existing opportunities, increased support of nonacademic research transitions, and championing the worth of non-tenure-track roles

NIH and academic institutions need to provide better support during the postdoctoral training period and their transition to the next phase—be it a faculty position, another type of academic or research position, or a position in industry.

Welcome and Introduction

Drs. Schwetz and Berger opened the meeting by explaining the purpose of the session and the working group’s charge, presenting data about the recent decline in postdocs and Dr. Ruth L. Kirschstein National Research Service Award (NRSA) F32 applications and awards, and welcoming the biomedical community to share their input regarding these topics.

Invited Speaker Remarks

Esra Yalcin, Ph.D., Postdoctoral Research Fellow at Boston Children’s Hospital and President of the Boston Postdoctoral Association, recommended that NIH increase postdoc salaries and provide local cost-of-living (COL) adjustments to combat the financial burden incurred by low pay for expertise, increase parental leave and implement creative solutions to help postdoc parents with the financial burden of childcare costs, expand the NIH inspection and reporting system for the ethical conduct of animal research to the ethical treatment of postdoctoral researchers, and improve policies on harassment and bullying to better protect postdocs from toxic mentorship, which disproportionately affects women, people of color (POC), LGBTQ+ individuals, and people from different religious backgrounds.

Bruce Mandt, Ph.D., Associate Dean of the Graduate School and Director of the Postdoctoral Office at the University of Colorado, Anschutz Medical Campus, recommended that NIH provide regionally adjusted NRSA salary rates and clarify NRSA language to allow institutions to provide equitable benefits to all postdocs regardless of funding source, set consistent postdoc training expectations and salaries irrespective of funding source, increase oversight of mentors, and provide

“Too frequently, postdocs are still seen as a cost-effective means to continue research profits and not as an investment in the future of biomedical research.”

training and funding for non-tenure-track faculty roles to address uncertainty regarding how postdoc training is moving an individual forward in their career.

Antentor Hinton, Ph.D., Assistant Professor of Molecular Physiology and Biophysics at Vanderbilt University, recommended that NIH frequently assess principal investigators' (PIs') mentorship and progress in imparting career development skills for postdocs and provide postdocs with mentoring committees, allowing for a comprehensive mentoring experience; structured training opportunities on professional and career development skills for transitioning to the next career stage; and more support during career transitions.

Facilitated Discussion

Working group members Judith Kimble, Ph.D., Professor at the University of Wisconsin-Madison, and Adriana Morales Gómez, graduate student at Mayo Clinic, facilitated discussion among public community attendees. Participants often elaborated on themes identified by the invited speakers.

Increasing financial support. Financial strain is a major barrier prohibiting postdocs from continuing in academic research. Postdocs, especially POC, individuals without generational wealth, and others who are underrepresented in biomedical research (UBR), cannot afford to continue, because of increased family obligations and a lack of COL adjustments. Relatively low pay for expertise results in postdocs feeling undervalued for their expertise and contributions. Examples of recommendations include the following:

- **Provide salaries commensurate with their level of expertise and adjusted to the COL of the position's location.** Suggestions that NIH should: Provide regionally adjusted NRSA rates, adopting systems other governmental systems (e.g., the U.S. Department of Veterans Affairs) already use. Include salary negotiations within mentoring plans.
- **Provide relocation fees and signing bonuses.** Making the critical transition from a doctoral to a postdoctoral position more financially accessible can help researchers feel more valued and give them the boost they need to be productive, increasing their enthusiasm for science.
- **Allow postdocs to receive benefits matching those received by other employees of the hiring institution.** Suggestions that NIH should: Clarify NRSA award language that prevents postdoc fellows from being considered employees at their hiring institutions. Encourage or even require institutions to consider all postdocs as employees, providing them with health insurance and the ability to start saving for retirement and achieving other life goals.
- **Provide different types of benefits or financial support to help with life changes and obstacles (e.g., family responsibilities).** Recommendations included extended parental leave (16 weeks instead of 8–12) and creative solutions (e.g., funding a laboratory technician to keep work going during leave).

Refining the infrastructure related to postdoctoral training and increasing mechanisms to encourage mentor accountability and oversight. Participants called for infrastructure and cultural changes within the research enterprise, including by disambiguating and recognizing the value and role of postdocs and providing more meaningful guidance and direction when transitioning to the next position—academic or not. Academic selection criteria frequently advantage those who already benefit from different forms of privilege, undermining opportunities to increase UBR representation. By setting different expectations for postdoc training based on NRSA or non-NRSA support, participants in the session expressed beliefs that

NIH establishes different classes of postdocs, contributing to institutional-level inequities. International postdocs need more structured training and career development because they are primarily supported by research grants and do not receive the benefits associated with NRSA grants. Recommendations included the following:

- **Democratize and standardize postdoctoral recruitment and access.** Suggestions that NIH should: Set consistent postdoc training expectations and salary amounts regardless of funding source. Consider unifying and standardizing postdoc recruitment data, and use a committee similar to grant review panels to appoint postdocs.
- **Outline professional and career development skills postdocs need to transition to independence.**
- **Provide training for postdocs in business and lab management—crucial skills for the next stage.**
- **Increase oversight and accountability of PIs for mentoring.** Suggestions that NIH should: Provide more detailed mentorship requirements in requests for applications (RFAs), expand the Individual Development Plan (IDP), and require that the IDP be regularly updated as part of the project progress report. Weigh PI performance in postdoc mentoring and career development equally with research progress as criteria for continued funding. Require or encourage mentoring contracts and support acquiring and transferring mentoring tools from PI to postdoc.
- **Increase transparency of PIs’ postdoc mentorship track records.** Institutions should be required to record and report clearly on department websites the names of each postdoc and their next position.
- **Require mentoring committees to ensure that postdocs receive all types of mentoring needed.**
- **Provide more grant types with realistic application requirements to aid career transition for all postdocs.** There is belief that the K99 is the only pathway to independence for international postdocs, and the application timeline is too short for postdocs in some fields to publish a first-author paper.
- **Pair absolute limits on total time allowable for support in postdoctoral training positions with an increase in other full-time employee positions that would allow scientists to achieve the milestones required to progress into the next career step.**

“So there’s this back and forth about—like, it’s nobody’s fault. It’s somebody else’s responsibility. And I think that clear communication and clear investment from both NIH and institutions is needed about how to support people during this transition.”

Expanding academic research opportunities and supporting nonacademic research transitions. Many participants discussed creating or formalizing other research specialist roles within the academic enterprise, allowing postdocs to stay in academia. They suggested that by supporting these roles (e.g., staff scientist positions) through specific training programs and funding opportunities and making them more common and easier to fund, NIH should lead the cultural shift regarding what it means to be a scientist and increase the satisfaction and agency of those pursuing science careers. Specific examples discussed included the following:

- **Use successful models like the Institutional Research and Academic Career Development Awards (IRACDA) to focus on providing access to additional career options.** For example, setting up pathways for postdocs to industry may help build public–

private partnerships, allowing postdocs to gain industry experience while still focusing on academic research.

- **Create more early-career awards for non-tenure-track faculty roles, allowing individuals to amass accomplishments to help facilitate postdocs to secure independent positions.**
- **Consider expanding the R50 mechanism and adding more RFAs to support non-tenure-track positions, which has benefited postdocs and institutions.** For example, consider creating a K99/R00 award for transitioning from postdoc to staff scientist.

Better tracking of postdoc outcomes. Participants also discussed the importance of having clear definitions and standard taxonomies regarding academic and nonacademic research positions to track the outcomes of NIH postdoc training programs effectively. One recommended solution was to create an NIH working group to facilitate coordination of the efforts to analyze current outcome data both in the aggregate and at the level of different institutions or departments, to provide more accurate outcomes.

Broader academic culture change. Many participants called on NIH to spearhead culture change in the academic perspective on postdocs, ideally to trickle down to institutional leaders and result in updated NIH reporting requirements. Participants suggested that NIH consider providing incentives for senior decisionmakers (e.g., institutional leadership, senior faculty) to ensure that these changes occur. They also suggested that NIH should consider changing research evaluation procedures specifically for grants and other products to align with those expressed by the Declaration on Research Assessment (DORA)—being more focused on the quality of the research being conducted, not the journal in which the findings are published, to the benefit of UBR labs and postdocs. These perspective changes could spur advances in changing the culture around postdocs publishing in top journals, which is difficult to achieve during a typical postdoc appointment period.

Virtual Listening Sessions, Meeting 2

Friday, March 10, 2023, 1:30–2:30 p.m. ET

Key Takeaway and Overall Summary of Session 2: International Postdoc Concerns

The invited speakers and attendees were aligned about areas of the international postdoctoral experience that need improvement. The cross-cutting themes focused on the following areas:

- Higher salaries and supplemental financial support, regardless of funding source
- Financial and administrative support to navigate immigration- and visa-related issues
- Visa extensions to align with overall contract duration
- Better oversight and monitoring of how international postdocs are treated
- More funding opportunities that are open to international scholars
- Creation of permanent nonfaculty positions to retain international talent
- Immigration education and training in American research-related values and approaches

NIH and academic institutions need to provide international postdocs with better financial and administrative support tailored to their unique situations, helping them pursue their academic careers on more equal footing with domestic postdocs.

Welcome and Introduction

Drs. Schwetz and Berger explained the purpose of the session and the working group's charge and presented data about decline in the number of international postdocs in the U.S., including survey results indicating that almost 75% of postdocs with temporary visas report that citizenship-related vulnerabilities have a high-level negative impact on their lives. The co-chairs welcomed the biomedical community to share their input regarding these topics.

Invited Speaker Remarks

Andrea Pereyra, M.D., Ph.D., Postdoctoral Scholar at East Carolina University and International Officer and Board Member at the National Postdoctoral Association (NPA), made the following recommendations to improve the international postdoc experience: Consider multiyear contracts that would allow for longer visa durations; create more funding opportunities for non-U.S. citizens, who also contribute to U.S. taxes; and urge institutions to create permanent nonfaculty positions to retain the talent that international postdocs represent.

“The [academic career] clock clicks differently for international postdocs with terminal degrees from abroad. Requirements for grants like the K99 or early career investigator status are just not realistic for them. I would like to see NIH specifically addressing this population of international postdocs and crafting career training and funding opportunities to overcome this gap.”

Natalie Chernets, Ph.D., Director of Postdoctoral Affairs and Professional Development and Associate Director of the M.D./Ph.D. program at Drexel University, made the following recommendations to address international postdoc challenges: Integrate immigration education into postdoctoral training; institute longer contracts, because initial visa duration is based on contract length, which is tied to daily documents such as driver's licenses (e.g., 3 years, with appropriate termination clauses); have NIH and other research organizations actively advocate for immigration reform, because retaining highly skilled young talent strengthens the U.S.

economy and maintains leadership in STEM; provide higher salaries and better employment benefits; and include international postdocs in diversity, equity, and inclusion (DEI) efforts to reflect the intersectionality of barriers and marginalization they face.

André Porter, M.S., Senior Program Officer for the National Academies of Sciences, Engineering, and Medicine Board on Higher Education and Workforce, identified four recommendations for institutions and governmental agencies to create a safe and inclusive research environment where international postdocs are valued and can thrive: Provide education about American research-related systems and values, connect international postdocs to mentors with similar lived experiences, help international postdocs navigate the immigration system, and provide additional or supplemental compensation to help cover extra expenses.

“Despite being the majority, international postdocs face additional challenges due to intersectionality of barriers and marginalization based on social economic status, culture, or country of origin or an accent; the field of study; or institution granting their doctorate. Discussion on diversity and inclusion needs to include such nuances, which are central to the international postdoc experience.”

Facilitated Discussion

Jodi Yellin, Ph.D., Director of Science Policy for the Association of American Medical Colleges (AAMC), and Tom Kimbis, J.D., Executive Director and Chief Executive Officer at the NPA, facilitated the discussion. Participants often elaborated on the themes identified by the invited speakers.

Assistance in navigating citizenship-related vulnerabilities. The top causes of financial and overall burden for international postdocs were the hurdles and limitations created by visa status and immigration requirements. For example, although postdocs may be on multiyear grants, most postdoc contracts are for a single year, requiring a relentless cycle of renewing immigration paperwork. This cycle causes unnecessarily high emotional and financial strain and decreases engagement in scientific activities requiring international travel. Recommendations to address these issues included the following:

- **Consider giving international postdocs multiyear contracts to avoid these life disruptions.** Standardize initial postdoc contract lengths to 3 years, with appropriate termination clauses. A 3-year contract alternative offers stability not only for international postdocs but for all postdocs.
- **Adopt an approach similar to NIH intramural policies regarding visas and termination.** Issue international visas at the institutional or NIH level rather than at the PI level, making it easier for postdocs to change labs without facing deportation or other consequences. Require a 6- to 12-month notice for termination.
- **Secure international funding to support the costs associated with immigration paperwork.**
- **Provide dedicated institutional staff to assist with international postdocs’ specific needs (e.g., needs related to visas, taxes, and housing).**
- **Provide immigration education and training for international postdocs and employing PIs.**

- **Provide guidance for international postdocs about taxes and the healthcare system in the U.S.**
- **Actively advocate for immigration reform to support the U.S. economy and maintain U.S. leadership in STEM.** Institutions of higher education and organizations that advocate for science and medicine innovation (e.g., NPA, AAMC, NIH) can also engage in shaping immigration reforms.

“I spend about a third of my time [engaged in] conflict resolution for postdocs and faculty.... I am particularly struck by the special vulnerability that international postdocs have to badly behaving faculty because of [their visa dependence]. I think that NIH is in a great position to take an extremely strong stance on bullying and accountability that would help ensure fair treatment of all postdocs and would especially serve the international population.”

Better compensation and benefits. International postdocs list financial burden as a top cause of stress and

discontinuation of their academic careers. For this group, the strain is amplified by citizenship- and immigration-related issues. International postdocs are often the sole providers for their families, because visa limitations may prevent their spouse or partner from working. In addition, the continual renewal requirements of short-term visas result in increased administrative and travel costs. To address these concerns, participants proposed the following recommendations:

- **Provide salaries that are commensurate with postdocs’ level of expertise and adjusted to the cost of living for the positions’ locations.**
- **Provide more oversight to prevent underpaying international postdocs.**
- **Provide adequate financial support for those who may be shouldering additional family responsibilities and facing other issues.**
- **Develop pathways for supplemental funding to support healthcare coverage, family care, retirement, and other benefits for postdocs inside and outside the NIH system.** For example, expand international postdoc programs to additional countries and continents.
- **Initiate the development of institutional plans that provide supplemental funding.**
- **Adjust leave and vacation policies to be less stringent and more equitable across institutions, especially where travel is required for visa renewal.** Consider allowing leave accrual.

More robust mentorship and support in transitioning to the American research culture and increased protection from harassment and bullying. International postdocs shared that they felt especially vulnerable to toxic work environments and largely unsupported in transitioning to a new culture and future career opportunities, especially as they depend on their mentors for both employment and recommendation letters to support permanent residency goals. They called for institutions and agencies to strive to create a safe and inclusive research environment where they are valued and can thrive, helping the U.S. recruit and retain their unique expertise. They identified mentoring as crucial for international students who are trying to navigate a different culture. The following recommendations were made:

- **Assist postdocs in finding well-fitting institutions and help them navigate potential cultural differences or political barriers.**
- **Prepare international postdocs for American research–related values, which may differ from those in their country of origin.**
- **Develop an extension to the National Research Mentoring Network for international postdocs.**

- **Create permanent nonfaculty science positions to retain international postdoc talent.**
- **Increase protection from harassment and bullying.**
- **Acknowledge and reward mentors who help international postdocs navigate obstacles and succeed in their careers.**

More funding opportunities without citizenship requirements and refinement of existing processes to be more welcoming to international postdocs. International postdocs feel their funding opportunities are limited, especially in the early years. If international postdocs want to pursue tenure-track positions, they fall behind their domestic peers, who can apply for fellowships from the start of their careers. Recommendations included the following:

- **Create more grants without citizenship requirements or broaden eligibility on currently available grants (e.g., F32s, T32s).**
- **Increase awareness of grants that do not require citizenship (e.g., from private foundations).**
- **Provide grant-specific training for an international postdoc audience.** For example, provide K99 webinars that offer technical assistance to reduce hesitancy among applicants and mentors. Offer training on grant components that may be unfamiliar to this population (e.g., diversity statements).
- **Allow international postdocs to apply for supplemental funding on existing grants.** This approach can help international postdocs access more resources and build their CVs.
- **Provide and promote resources that can help international postdocs in difficult situations (e.g., grants to help applicants get out of toxic work environments).**
- **Promote the creation of a “world open research passport” for postdocs affiliated with a research institution, allowing them to travel internationally for conferences and career advancement.**

Virtual Listening Sessions, Meeting 3 Friday, March 17, 2023, 12:30–1:30 p.m. ET

Key Takeaway and Overall Summary of Session 3: Compensation and Benefits (Including Child and Dependent Care)

Invited speakers and attendees were aligned on needed improvements in postdoc compensation and benefits. The cross-cutting themes were requests for NIH to facilitate the following:

- Higher salaries and local COL adjustments, no matter the funding source
- Ensuring that postdocs, regardless of funding source, are considered employees and receive benefits from their institutions
- Improved childcare support through more generous leave or relief policies and higher childcare subsidies or supplements

NIH and academic institutions need to provide postdocs with higher pay commensurate with their expertise, local COL adjustments, better benefits, and more avenues for childcare and family support, valuing their expertise and incentivizing their pursuit of academic careers.

Welcome and Introduction

Drs. Schwetz and Berger explained the purpose of the session and the working group’s charge, presented data about differences in postdoc salaries in comparison with those in other biomedical industries, and welcomed the biomedical community to share their input regarding these topics.

Invited Speaker Remarks

Krishna Mudumbi, Ph.D., Postdoctoral Associate at Yale University, recent Vice Chair of Yale’s Black Postdoctoral Association, and recent Chair of the Yale Postdoctoral Association, provided three recommendations for NIH to improve postdoc salary and benefits: Increase postdoc salaries to a minimum of \$65,000 to \$75,000 and provide local COL adjustments, double childcare benefits (to at least \$5,000) and allow all postdocs irrespective of funding source to apply for them, and clarify NRSA language to allow institutions to provide equitable benefits to all postdocs regardless of funding source.

Lola Eniola-Adefeso, Ph.D., Professor and Associate Dean for Graduate and Professional Education in the College of Engineering at the University of Michigan, recommended the following: Increase compensation to be commensurate with what postdocs would receive in biomedical industry jobs (e.g., \$90,000) and provide local COL adjustments, emphasize the phenomenal cutting-edge research being done across the U.S. (e.g., in areas in the middle of the country that offer good quality of life and lower COL), and consider different funding models for postdocs (e.g., the National Science Foundation model, where postdocs bring in their own fellowships).

“Postdoctoral scholars are professionals—they have the highest degree in their field. We need to incentivize [those] who are interested to be able to [pursue an academic career] without giving up earning power.... Science should not be the career that you choose and then you end up being poor, which is essentially how we’re structuring it.”

Tori Osinski, Ph.D., Postdoctoral Fellow and President of the Postdoctoral Association at the University of Minnesota, recommended three courses of action by the NIH regarding this issue: Increase postdoc salaries and provide local COL adjustments, change rules or language allowing postdocs to be designated noninstitutional employees, and require that research institutions that

receive NIH grants adhere to base salaries, annual COL adjustments, and merit-based raises for postdocs.

Andrew G. Campbell, Ph.D., Professor of Medical Science and former Dean of the Graduate School at Brown University, recommended the following action by NIH: Encourage and help institutions to offer more generous parental leave programs, more paid time off for postdocs who are birth and/or adoptive parents, and childcare subsidies. He also believes that the postdoctoral population will likely grow in size, amplifying the concerns of postdoctoral trainees, and that NIH should consider how to mitigate the circumstances leading to postdoc dissatisfaction while also preparing strategies for continuing research in the face of potential work disruptions and stoppages.

Facilitated Discussion

Emily Miller, Ph.D., Deputy Vice President for Institutional Policy, Association of American Universities, and Mr. Kimbis facilitated the discussion. Participants often elaborated on the themes identified by the invited speakers.

Higher compensation and better benefits. Participants listed financial burden as a top cause of stress and of discontinuation of their academic careers. They felt undervalued and underpaid relative to their counterparts in other science-related industries. Participants highlighted that many postdocs receive salaries far below the NRSA minimum (\$56,484 in fiscal year 2023), which they suggested is insufficient for most postdocs with families and results in the reduced representation of women and members of underrepresented communities in later academic career stages. The following actions were recommended:

- **Encourage or require institutions to contribute to postdoc salaries.** Academic research institutions rely on a largely underpaid research workforce, and participants suggested they should contribute to paying that workforce—especially large institutions with substantial resources.
- **Ensure a minimum salary of \$65,000 to \$70,000 for all postdocs to sustain academic science in the U.S.** Participants felt postdocs would ideally be paid the equivalent of what they would make in entry-level positions in other science-related industries.
- **Adjust salaries based on COL of position location.** Participants suggested that salaries for postdocs living in expensive metropolitan areas should be higher (minimum \$75,000) and that the federal General Schedule scale, which already has a locality-adjusted scale to pay government employees, may serve as a model.
- **Increase modular budget thresholds to incentivize institutions to raise postdoctoral salaries.**
- **Provide relocation support (moving expenses and other incentives).**
- **Require that universities disclose their postdoc salaries and provide justification if they are paying less than the NIH minimum.**

“In my experience, postdocs actually don’t receive any more or less training than somebody starting a new job. Everybody receives training when they start a new job.... If we wish to have a diverse academic community and leaders, we need to make that career path accessible to everybody. [Compensation] shouldn’t be lower just because we’re receiving training.”

“Institutions dictate postdoctoral salaries, and many PIs encounter resistance when trying to increase their postdoctoral salaries.... There seems to be a disconnect between the institution and [their communications] with the NIH and understanding the scale that [NIH has] set.”

- **Follow examples from other governmental agencies in guaranteeing equitable, standardized pay and benefits for fellows.** The National Aeronautics and Space Administration (NASA) now requires that its postdoc fellows be appointed in employee-like positions and provides grants with the appropriate fringe rate to pay for full employee benefits.
- **Expand access to student loan benefits to include postdocs.** Many postdocs have deferred payment on undergraduate loans through graduate school and must begin repayment during postdoc training.

More assistance with life steps. Participants explained that pursuing an academic career takes longer than in the past, so many postdocs are older and starting families or developing other aspects of their lives. Many postdocs move across the country or the world to engage in their academic pursuits. However, their support networks can be limited compared with what is typically available to most other early-career professionals. Participants highlighted how the impacts of low pay are exacerbated by the often-prohibitive expense of childcare, causing many to leave the academic career track. Recommendations to address these issues included the following:

- **Increase the dollar amount of NIH childcare benefits (minimum \$5,000 per year) and extend eligibility to all postdocs, regardless of funding source.**
- **Provide dependent health insurance subsidies and backup care for postdoc families.** For example, one institution provides up to \$5,000 per child for up to three children for families under a certain income threshold.
- **Extend parental leave to 12 weeks.**
- **Encourage or support institutions to give paid time off for birth and adoptive parents.**
- **Provide parental relief options.** Suggestion that postdocs be able to request parental relief (in the form of a stipend or other benefit) to care for newborn infants or young children for a predetermined number of times during their appointment.

Virtual Listening Sessions, Meeting 4 Monday, March 20, 2023, 1:30–2:30 p.m. ET

Key Takeaway and Overall Summary of Session 4: Job Security, Career Prospects, and Quality of Life

Invited speakers and attendees were aligned about needed improvements in job security, career prospects, and quality of life experience for postdocs. The cross-cutting themes focused on the following areas:

- Increased investment of academic institutions in the research workforce
- Infrastructure changes in postdoc training
- Increased accountability and oversight of institutions and mentors
- Explicit and extensive career development opportunities for postdocs
- Changes to the research culture and infrastructure to correct detrimental aspects of power imbalances in academia

NIH and academic institutions need to provide better financial and career development support to postdocs, valuing their expertise and allowing them more agency with respect to their jobs and future careers. These changes will lead to improved research outcomes and increase postdoc retention and job satisfaction.

Welcome and Introduction

Drs. Schwetz and Berger explained the purpose of the session and the working group's charge and presented data about the decline in the number of postdocs pursuing academic careers and postdocs' diminished satisfaction in their career prospects. The co-chairs welcomed the biomedical community to share their input regarding these topics.

Invited Speaker Remarks

Neal Sweeney, Ph.D., former Postdoctoral Fellow and Academic Researcher at the University of California, Santa Cruz and now President of the Union of Postdocs and Academic Researchers, UAW Local 5810, advocated forming unions in which postdocs themselves have the agency to address problems as the main way to deal with the power imbalance in research workplaces. He provided three recommendations for NIH: Put measures in place to improve postdoc job security, such as just-cause protections and adequate contract lengths; require grantee institutions to have grievance processes with a neutral third-party arbitrator to ensure protections against harassment and bullying for everyone; and require grantee institutions to remain neutral when workers are considering forming a union.

Stevie Eberle, M.Ed., Executive Director of Stanford Biosciences at Stanford University, broadly advocated for implementing new models of academia. Specific recommendations included the following: Provide human resources (HR)–related support, center the postdoctoral training experience by providing postdocs with academic and nonacademic staff as mentors and championing nonacademic careers as viable professional options, integrate academic advising with career centers, revamp tenure by holding faculty accountable for the treatment and success of their trainees and students while still protecting their intellectual freedom, create clear expectations and

“Allowing [the] candor that some postdocs may go into other fields and providing education and preparation for these fields allows for completion of strong academic science on a short term, well-defined basis.”

standards for postdocs' time to completion and for their proper treatment in labs, monitor repeat offenders in the area of unprofessional behavior and hold them accountable, provide ways for postdocs to report concerns to NIH anonymously, recognize that institutions should provide better support systems and benefits, and create clearer career pathways for postdocs for academic and nonacademic positions.

Dawn Bonnell, Ph.D., M.S., Senior Vice Provost for Research at the University of Pennsylvania, recommended three courses of action regarding this issue: Provide a more balanced approach to postdoc professional development by offering more aggressive exposure to skill sets that match nonacademic job opportunities, prepare postdocs to transition to their next career step within 5 years, consider new pathways to academic positions, and expand the modular budget or explore other ways of increasing financial support for postdoctoral training.

Facilitated Discussion

Donna Ginther, Ph.D., M.A., Professor and Director of the Institute for Policy & Social Research at the University of Kansas, and Chrystal Starbird, Ph.D., Assistant Professor at the University of North Carolina at Chapel Hill, facilitated the discussion among public community attendees. Participants often elaborated on the themes identified by the invited speakers.

Increase financial support and career development and research funding for postdocs.

Participants commented that although academic postdocs play a vital role in scientific research in the U.S., they are often underpaid than other sectors. The participants also pointed out that postdocs on NIH fellowships often do not receive a fair share of the benefits available to other employees at their institutions. Many participants noted that the NIH modular budget has stayed the same for more than 20 years, and faculty are being pushed to their limits by institutions to increase salaries and benefits for their postdocs without other sources of funds. Participants called for changes to the modular budget or overall funding system for postdocs to support increases in benefits and living wages. Their recommendations included the following:

- **Require academic institutions to contribute more to support the academic enterprise and its workforce.**

One suggestion was for NIH to work with other government funding agencies to unilaterally require that institutions provide at least 50% to 75% of the base salary for full-time academic researchers and treat them as employees with benefits.

“[Academic institutions] enormously benefit from the labor of postdoctoral researchers, and they need to contribute their fair share.”

- **Encourage institutions to hire tenure-track faculty at a rate commensurate with the relative growth of administration in those institutions.**

- **Consider funding mandates that regulate the number of graduate students versus permanent academic researchers.**

- **Expand access to student loan benefits to cover postdocs.**

- **Include more career development opportunities and support networks for postdocs in existing postdoctoral grant mechanisms.**

One suggestion was to use T32 grants to encourage department-wide recruitment of a cohort of postdocs to provide a better support system and to include professional development funding

“[Institutions are telling] faculty, ‘You need to find the funds.’ And so it kind of comes back to a lot of pressure on faculty, who I don’t think are really the enemy here. The system needs to better provide resources to help them pay their postdocs living wages and support their benefits.”

to prepare postdocs for the academic job market (e.g., support postdocs giving seminars at hiring institutions and provide grant writing workshops).

- **Ensure professional development training for all postdocs, regardless of funding source.** Provide or facilitate training to prepare for nonscience aspects of the job search and early faculty positions (e.g., mentoring, developing grant budgets, negotiating startup funds, learning how to conduct chalk talks).
- **Expand R award eligibility requirements to include postdocs.** Encouraging universities to allow postdocs to apply for R awards could increase postdoc success during academic job searches.

Address the power imbalance inherent in the current academic hierarchy by restructuring the academic research system and taking other actions. Participants emphasized that postdocs have little to no power in the current academic system and little protection against wrongful termination and institutional or adviser misconduct. Some participants explained that current investigations into the misconduct of PIs and administrators often do not have substantive outcomes, because separately handling each complaint obscures overall patterns of misconduct. Recommendations to address these issues included the following:

- **Provide fair termination policies.** Postdocs often do not have protection against termination without cause. Unfair employment terminations are especially disruptive for international postdocs.
- **Encourage institutions to remain neutral if postdocs want to establish unions or take other actions to protect their rights.**
- **Provide better and more comprehensive monitoring, accountability, and evaluation of questionable behaviors by PIs or others in positions of power.**
- **Distribute academic advising responsibilities to career center staff.** This approach can provide postdocs with unbiased sounding boards and feedback while relieving faculty of some complex responsibilities.
- **Reimagine the path to tenure-track positions.** For example, create a different track for junior postdocs to have pre-faculty positions with a path to tenure. *Note: Some participants opposed adding additional steps or pathways to tenure-track positions.*
- **Provide management training for PIs.**
- **Provide postdoc funding directly to the postdoc rather than the PI.** This approach would incentivize institutions to improve their work environments and to allow postdocs to change institutions or PIs in abusive or poorly fitting situations.

“A huge reason I am no longer planning on becoming an independent investigator is lack of support from my mentor. He has a number of R01s and is well funded, but there is no oversight on his actual mentoring activities.”

Reimagine and broaden career training opportunities for postdocs. Participants called for more support and structure for postdocs pursuing nonacademic science careers.

Recommendations included the following:

- **Restructure the postdoctoral experience to include training and a pipeline into nonacademic science positions.** Three possibilities were suggested under this recommendation: a two-phase system for postdocs, where they all go through a 1- to 2-year “trainee” period before choosing from several clearly defined career tracks (e.g., industry, young investigator, core scientist), a system that tailors postdoctoral experiences to specific

job goals (e.g., providing internships with nonacademic partners for those who are interested), or a two-track system separated according to postdocs' interest in pursuing academic or nonacademic careers.

- **Partner with existing large-scale national workforce development programs to broaden the postdoc experience and, ideally, increase retention of postdocs' talent.**
- **Increase awareness of nonbiomedical career options.** For example, postdocs who want to continue in social science research may be unsure of what kind of opportunities exist outside of academia; offering information on their options would be helpful.

Take meaningful actions to increase the participation of those from UBR populations. Some participants highlighted the importance of enacting rules and policies in academic institutions and making other structural changes to help support and retain UBR researchers, taking into account each group's unique experiences. Other participants felt that the current focus of NIH research on investigating biological mechanisms results in the underfunding and de-prioritization of research into social and structural determinants of health, which is often conducted by researchers from UBR populations on participants from UBR and socially disadvantaged groups.

“Diversity, equity, inclusion, and accessibility efforts will continually fall short without a significant change in scientific culture. The UNITE initiative, for example, is a promising start, but ending structural racism is a long road ahead.”

Discussion

Throughout the four sessions, the overarching message from the participants was that postdocs want and need increased and better financial, administrative, and career development support from NIH, employing academic institutions, and their mentors. Most of the challenges associated with the postdoctoral experience fell under three themes: financial strain, limited and unclear career development support, and a power imbalance that favors mentors and institutions.

Theme 1: Financial strain

Across the series, financial strain was the most prominent cross-cutting theme. Participants felt that mitigating the financial strain and ambiguity associated with postdoctoral training would go a long way in retaining participants in academic or research-based careers and increasing their job satisfaction. To address this issue, participants called for salaries commensurate with their level of education and expertise, employee benefits, and improved childcare support through subsidies or supplements. International postdocs specifically requested financial and administrative support to navigate immigration- and visa-related issues and for visa extensions aligning with the overall durations of their contracts. Many participants emphasized that the current levels of stipends and childcare support often disproportionately affect those individuals without generational wealth, people of color, and others who are underrepresented in biomedical research from continuing this career pathway.

Theme 2: Limited and unclear career development support

Across the sessions, participants identified the limited and unclear career development support associated with their training as a prominent obstacle to their career progression. Participants emphasized the need for increased administrative, training, and financial support for postdocs transitioning to the next stage of their careers—whether to an academic or a nonacademic science position. Participants especially called for increased academic research positions beyond existing opportunities and increased support of nonacademic research transitions. They expressed that championing non-tenure-track roles and supporting transitions into these types of roles would increase their job satisfaction. As for academic positions, they suggested increasing funding opportunities and training in non-research skills would help those pursuing an academic career to be more successful.

Cross-cutting takeaways

Participants requested the following:

- Higher salaries adjusted to local COL, regardless of the funding source
- Equitable treatment by employing institutions, such as providing employee benefits
- Increased accountability and oversight of institutions and mentors, with special attention to monitoring how the vulnerable groups are treated (e.g., international postdocs)
- Infrastructure changes in postdoc training that provide clearer career pathways
- Increased research funding opportunities for all postdocs and supplemental funding to help with life necessities (e.g., childcare, navigation of immigration-related issues for international postdocs)
- Explicit and extensive career development opportunities for postdocs, which includes meaningful training opportunities beyond academic or research-specific skills
- Providing more academic research positions beyond existing opportunities, increased support of nonacademic research transitions, and championing the worth of non-tenure-track roles
- Changes to the research culture and infrastructure to correct detrimental aspects of power imbalances in academia

Theme 3: Power imbalance

A third particularly important cross-cutting theme was a power imbalance that favors mentors and institutions. Participants advocated for addressing this power imbalance through better accountability and oversight of employing institutions and mentors. Participants emphasized that postdocs, particularly international postdocs, have little to no power in the current academic system and little protection against wrongful termination. They called for better and more comprehensive monitoring, accountability, and evaluation of questionable behaviors by PIs or others in positions of power. Since toxic mentorship disproportionately affects women, people of color, LGBTQ+ individuals, and people from different religious backgrounds, participants felt that improving policies on harassment and bullying to better protect postdocs can improve the job satisfaction of all postdocs and increase the participation of people from these underrepresented groups. International postdocs felt especially vulnerable to toxic work environments because of their immigration status.

Overall, many participants expressed their love of science and their desire to follow science-related careers and advocated that implementing changes to address the challenges identified throughout the sessions could go a long way in improving the postdoctoral experience.