

The NIH Advisory Committee to the Director (ACD) Working Group on Diversity (WGD) developed [13 recommendations](#), as reported at the June 2017 ACD meeting. Focused on institutional change, these recommendations encompass four thematic areas: 1) New Programming; 2) Career Independence Transition; 3) Recruitment, Advancement, and Efforts to Sustain Interest; and 4) Grant Funding. The ACD WGD met in March 2018 to flesh out these recommendations with specific and actionable next steps. This report maps those activities within the NIH internal and external landscapes and ongoing activities related to fostering an inclusive culture that unleashes the power of diversity to achieve research and institutional excellence. An overarching need is a fuller understanding of the breadth of types of diversity that affect workplace climate, recruitment, advancement, and retention. Addressing this need calls for a potential expansion of the types of demographic data NIH collects from all applicants.

NIH's Scientific Approach to Workforce Diversity and Focus on Institutional Accountability

The original ACD WGD issued its [first set of recommendations in 2012](#), one of which established a new position: the NIH Chief Officer for Scientific Workforce Diversity (COSWD). NIH hired cardiologist and national leader in scientific workforce diversity Dr. Hannah Valentine to assume the inaugural position. Since her hire in 2014, NIH has embraced a rigorous scientific approach to enhancing scientific workforce diversity in both the NIH intramural workforce and the extramural workforce.

Soon after her arrival, the COSWD led the launch of the NIH-funded [Diversity Program Consortium](#) (DPC), a novel NIH investment using the scientific method to develop evidence-based strategies that enhance scientific workforce diversity, with a particular focus on new interventions to address sociocultural impediments and creative approaches to mentoring that enhance retention and career advancement. The DPC is using specific "[hallmarks of success](#)" to measure change and evaluate impact. A primary DPC component is [Building Infrastructure Leading to Diversity](#) (BUILD), a 10-institution nationwide effort that is connected to 100 partnership institutions. BUILD addresses novel approaches for intervening on the issues that affect entry and advancement during training; the program [is making significant progress](#) toward understanding effects on students, faculty, and institutions of contributory factors such as science identity, resilience and persistence, stereotype threat, and financial assistance.

As also recommended by the ACD WGD in 2012, the SWD office looked first to the intramural research program (IRP) as a space in which to pilot new programming and methods to measure, and enhance, diversity, and inclusion. These efforts have been underway since 2015 and have recently been packaged into the [NIH Scientific Workforce Diversity Toolkit](#), which aims to help institutions enhance faculty diversity through four integrated strategies: 1) Diversifying candidate pools; 2) Reducing implicit bias in recruiting and hiring processes; 3) Proactive outreach to establish bidirectional communication between diverse talent and institutions; and 4) Mentoring relationships that promote career development and promotion.

SWD is currently promoting these evidence-based tools, developed and honed within the NIH IRP, both within NIH and to extramural institutions. The intended audience is academic leadership, as it is well documented that "change comes from the top," and that institutional commitment to inclusive excellence relies upon leadership endorsement. In addition to these tools, SWD has developed and begun implementing interventions targeted at institutional change in

the IRP. At the core of these strategies is leadership engagement, oversight, and accountability. Acting on recommendations from the [Addressing Gender Inequality in the NIH Intramural Research Program Action Task Force](#), which the COSWD chaired in 2016, the [NIH Equity Committee \(NEC\)](#) has been created to implement recommendations across the NIH IRP. The overarching goal of the NEC is to establish a systematic approach and necessary framework for a culture that values diversity, inclusion, equity, and mentoring.

To accelerate NIH's ongoing efforts and to build on progress, the 2018 ACD WGD recommendations thus address institutional change as an iterative process to achieve cultural transformation required for a thriving, diverse, and inclusive biomedical workforce.

2018 ACD WGD Recommendations: Four Themes

I. New Programming

The National Institute of General Medical Sciences (NIGMS), with its longstanding interest in enhancing diversity, established and recently renewed its funding portfolio to understand and inform interventions that promote the research careers of students in biomedical and behavioral sciences. Many approaches are being tested and evaluated through this body of research (see [Understanding Interventions](#)), as well as through the DPC, noted above. The results of these data-intensive programs should serve as models across NIH.

A logical next step is for NIH to reach out to other organizations and sectors—within government, academia, and industry—to form alliances based upon shared goals. Potential partners are industry (both the life sciences and information technology sectors), in part through the well-established small-business program funded for many years by the federal government in the form of the NIH Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) initiatives. In addition, several well-established organizations within the higher-education arena with which NIH can partner (or greatly enhance ongoing collaboration) include the Association of Public and Land Grant Universities (APLU), the Association of American Medical Colleges (AAMC), the American Association for the Advancement of Science (AAAS), the Coalition of Urban Serving Universities (USU), and others. Taken together, these pieces may fit into a new form of programming—public-private alliances—that target a particularly weak component of the biomedical career trajectory: that of achieving career independence. SWD has previously put forth an integrated framework to house such programming: the NIH Hubs of Innovation in Scientific Workforce Diversity. One key activity for such an endeavor is to explore if and how workforce diversity affects the outputs of biomedicine: choice of research topic, career choice, impacts of sociocultural influences on career development and advancement, novelty of health applications for an increasingly diverse nation, among others.

Current recommendations:

Recommendation 9: NIH should pilot a nationwide public/private partnership model (currently conceived as Hubs of Innovation in Scientific Workforce Diversity).

Recommendation 11: A trans-NIH partnership should launch a funding announcement requesting proposals on research projects focused on the science of scientific workforce diversity.

Discussion

Scientific workforce diversity is a dynamic system affected by both “push” and “pull” forces, reflecting trainees and institutions, respectively.

Promoting inclusive excellence fosters institutional-level change. Various institutional programs noted by ACD WGD members and NIH staff involved with scientific workforce diversity provide potential strategies for helping faculty thrive.

- The [University of California \(UC\) President’s Postdoctoral Fellowship Program](#)—with a considerable track record since its inception in 1984—encourages outstanding Ph.D. recipients from a variety of backgrounds to pursue academic careers within the UC system. The current program offers postdoctoral research fellowships, professional development, and faculty mentoring to outstanding scholars in all fields whose research, teaching, and service will contribute to diversity and equal opportunity throughout the UC system. Faculty hiring of individuals from this program contributes to [enhancing faculty diversity](#) across the UC system: [recent data](#) suggest that this program and its companion Chancellors’ Fellowship Programs (CFP) have accounted for 11.5 percent of new URG faculty hired into the UC system in the last 10 years.
- The [Gilliam Fellowships for Advanced Study](#) supports exceptional Ph.D. students committed to careers in academic research to develop a diverse and highly trained workforce prepared to assume leadership roles in science, particularly at the college and university faculty level. An interesting aspect of this fellowship is the requirement that the fellows’ mentors are expected to participate in workshops designed to improve their mentoring skills.
- The [Hanna H. Gray Fellows Program](#), just recently launched, seeks to increase diversity in the biomedical research community by providing information about biomedical career opportunities to early-career scientists who are from gender, racial, ethnic, and other groups underrepresented in the life sciences. Fellows receive funding through their academic institutions for postdoctoral training and may continue to receive funding during their early-career years as independent faculty.
- [Duke School of Medicine’s training program for mentors](#) does not distinguish faculty rank and employs a cohort-based mentoring model, with the objective of taking a group of successful people and helping them understand how to help others become successful in the long term (“train the trainer” approach). The program incorporates elements from both the basic and social sciences and also includes foci on cultural understanding, effective communication, and self-advocacy.

Create an institutional award that convenes stakeholder sectors

Mentoring only goes so far—also needed is a purposeful pull to “get people over the finish line.” Although there are many good training programs for mentors and mentees, what is missing is a strategy to prepare well-trained scientists for specific career paths: essentially connecting trainees with employers who need specific skill sets (beyond channeling people to research-based academic faculty jobs). This type of program requires buy-in from leadership, but since there is a lack of diversity across sectors, why not bring all the stakeholders to the table to generate solutions that will enable scientists to make informed career choices?

- One novel vehicle for convening multiple stakeholders aiming to enhance diversity might be an institutionally targeted training grant, with the goal of developing faculty rather than students and postdoctoral researchers as is the current standard (T32 NRSA grants issued by NIH). Such a faculty “training program” would invite research universities to propose strategies to recruit, develop, and support faculty, including those from URGs. To promote buy-in beyond academia, such a training grant for faculty should be aspirational, with contributed funding by non-NIH partners. A positive outcome would be both “push” and “pull” success, attracting and keeping excellent faculty, including individuals from URGs. The appropriate framing of such a program is essential to avoid the unintended stigma for URG faculty, in particular, “as needing extra help,” and to ensure that it is not perceived as a “deficit model.”
- Currently, many major research-intensive institutions do not have the will to “pull” people out of training into faculty ranks wherein they become colleagues. This risk aversion is driven by the challenges to obtaining research funding for early-stage investigators, particularly those from URGs. NIH should partner with institutions to reduce this risk aversion using funding mechanisms that provide grants to support the transition into an early-independence

career phase. A partnership as envisioned would incentivize institutions to adopt best practices in faculty hiring, along with providing resources to ensure faculty advancement.

- NIH's [Broadening Experiences in Scientific Training \(BEST\)](#) program has created a nationwide network and infrastructure to [promote career transitions and exploration](#) of various scientific careers important for advancing the NIH mission. NIH should leverage the BEST infrastructure and incorporate lessons learned from it to build an integrated approach to enhancing diversity and inclusion in career transitions to independence.

Next steps to implement recommendations 9, 10:

- Define stakeholders by surveying selected programs with good track records as noted by ACD WGD members and NIH staff (NIGMS programs, Understanding Interventions program, and others)
- Conceive an institutional award that convenes stakeholder sectors
- Conceive a faculty-focused "training" grant for institutions

II. Career Independence Transition

Compared to individuals from majority groups, there is attenuation of NIH-funded URG trainees and fellows from the postdoctoral to the early-career period, a problem that requires additional focus. The gap is apparent across programs including F and K awards, as well as K08, K23, and K99 awards, and T awards. Any system redesign must ensure that all underrepresented groups are addressed, and as noted previously, NIH should collect additional demographic data (e.g., sexual orientation, gender identity, [disability type](#), and perhaps others) of all applicants to more fully understand impacts of underrepresentation on the scientific workforce and on its outputs.

Current recommendations:

Recommendation 3: NIH should collect data to identify whether any NIH policies and practices are acting as barriers or facilitators to creating a diverse scientific workforce at extramural institutions and identify ways to mitigate those barriers and support facilitators.

Recommendation 7: NIH should partner with academic institutions and professional societies to develop accountability policies and metrics that enhance diversity in the transition from trainee to independent careers.

Recommendation 8: NIH should recognize the value provided by teaching at various levels, toward recruiting individuals from underrepresented groups who had not considered science careers.

Discussion

NIH diversity supplements are effective but underused

- NIH could enhance the visibility and use of its [diversity supplement program](#), which allows funded PIs to request supplemental funds to enhance diversity by supporting and recruiting students and postdoctoral fellows from diverse backgrounds, including groups that are underrepresented in health-related research. An [outcomes analysis conducted by NIGMS](#) in 2015 showed that the majority of diversity supplement awardees chose research and research-leadership careers in multiple sectors important to the U.S. biomedical research workforce. Almost every research grant mechanism is eligible for a diversity supplement, but these supplements currently represent less than 1 percent of NIH dollars. IC leadership should expand their use of diversity supplements, by implementing changes that more explicitly enhance diversity of the biomedical research workforce, particularly in the transition to early independent career stage. ICs vary widely in both use and standards for diversity supplements. There is a need to standardize these processes across ICs, with the goal of improved tracking and evaluation of outcomes. Increased use of diversity supplements for postdoctoral fellows may help bridge attrition to early-career faculty positions,

particularly among URGs. Adding explicit career-development elements may also enhance the value of these awards that are relatively easy for PIs to acquire.

- NIH should also encourage broader use of K99/R00s across ICs, particularly in large, well-funded studies such as the [BRAIN Initiative](#) or the Clinical and Translational Science Awards (CTSA) program, which in some ICs offers [KL2 Mentored Clinical Research Scholar Awards](#) to encourage clinical research from early-career investigators. These portable awards promote transition to independence and are not anchored to specific institutions.

Enhanced communication and proactive outreach provide opportunities to attract more URG talent into biomedicine

- Community colleges have significant enrollment of URG students interested in STEM careers and represent a mostly untapped pool of talent. Another resource is the trans-NIH initiative to enhance collaborative research between [Tribal Epidemiology Centers](#) and extramural investigators on topics focused on minority health and health disparities in American Indian/Alaska Native populations.
- Barriers to career transition also involve costs to institutions; such is often the case for URGs with disabilities. Without a thorough assessment of representation in concert with the necessary support systems, some highly trained individuals may be left out inadvertently, due to potentially greater investment of funds to train or advance scholars from some underrepresented groups.
- NIH should host webinars about the many resources, including diversity supplements, available to attract diverse talent.
- NIH should also devote time and resources to discussing diversity at its recurring Regional Seminars.
- Enhance distribution and dissemination of the NIH SWD Toolkit.

Expand on existing, successful programs that focus on teaching and research, since many URG trainees express interest in teaching

- Expand the [Institutional Research and Academic Career Development Awards](#) (IRACDA) to create as a framework for parallel programs that focus on preparing scientists for research careers in academic, industry, and other sectors. IRACDA develops a diverse group of highly trained scientists by combining a traditional mentored postdoctoral research experience with an opportunity to develop academic skills, including teaching. As shown in a [2016 outcomes analysis](#), IRACDA has been a very successful and competitive program; 73 percent of its participants pursue faculty positions. Because IRACDA has existed since 1999, it is amenable to further study through analysis of cohorts.
- Participate in the annual [Institute on Teaching and Mentoring workshop](#), which is one popular program that provides Ph.D. scholars, including those from URGs, the tools they need to successfully enter the ranks of the nation's universities.

Gain more understanding on attrition

- Create workshops to hear from graduate students and post-docs about their experiences
- Measure community climate such as through use of the NINDS' "Why?" survey (designed to assess the factors that influence decisions about career transitions), and exit surveys conducted as part of K awards and NIH loan-repayment programs

Next steps to implement recommendations 3, 7, 8:

- Expand awareness and use of, and standardize procedures and requirements for, NIH diversity supplements; prospectively evaluate career trajectories of recipients of diversity supplements using the newly established electronic submission process for these supplements
- Consider a trans-NIH funding announcement to expand IRACDA to focus beyond teaching
- Develop and host NIH webinars (and modules at Regional Seminars) on diversity and inclusion programming; encourage/capture feedback from community through such channels and publish these findings
- Establish connectivity with organizations that represent/communicate with community colleges and tribal organizations

III. Recruitment, Advancement, and Efforts to Sustain Interest

Paramount to the discussion of how to enhance scientific workforce diversity and inclusion nationwide is to assess whether there is a palpable will to make change. Many people state that they value diversity and inclusion but do not follow those statements with tangible actions and policies. Thus, it is critical for NIH to lead by example in making a definitive case for diversity and inclusion as a driving force for research excellence. NIH must target institutional structures and leadership to accomplish this goal.

Recommendation 1: SWD should promote systematic review and transparency of hiring and promotion procedures and policies to intramural and extramural research leaders (faculty, department chairs, and deans).

Recommendation 6: NIH should promote institutional partnering to disseminate best practices from successful recruitment and retention models.

Recommendation 10: SWD should develop and share its integrated recruitment and retention methods as an open-source toolkit that addresses how to diversify the candidate pool (via searching various sources that house diverse talent), conducting unbiased talent searches and proactive outreach, and fostering inclusion and belonging.

Disentangle hiring from advancement because the issues are not the same

- Because biomedicine is a long journey from student to career independence and well beyond, there are many steps along the way. Each transition forms a weak point where attrition occurs. Currently, for URG individuals the most pronounced stages of attrition are STEM persistence in college and faculty attainment. For this reason, remedies for closing gaps differ by stage; those issues affecting undergraduates are starkly different for post-docs seeking academic careers. Moreover, recruitment strategies are quite different from hiring strategies (push and pull), and career advancement is yet another challenge requiring institutional and individually targeted strategies. Thus, while general principles apply to URG representation in STEM across the career path, unique perspectives are relevant at each stage.
- There is a need for more transparency in institutional hiring policies, such as disclosing how search-committee members are selected and codifying tenure criteria.

Motivate institutions to pursue inclusive excellence

- Academic institutions are driven by incentives that are aligned with their mission and resources. NIH can use its levers to encourage institutions to enhance diversity and inclusion by providing “scorecards” that will generate data for comparisons across institutions. Competition can be a strong driver. One example known to promote institutional competition is the *U.S. News and World Report* rankings system of research institutions. To the extent permitted by law (including the Privacy Act and the Paperwork Reduction Act), NIH institutes and centers (ICs) should request and publicize diversity and inclusion metrics for institutions receiving NIH grants.

- NIH should develop a range of strategies to motivate institutions to adopt inclusive excellence as an institutional standard.
- SWD has made some progress in promoting transparency by establishing the NIH Equity Committee (NEC), in which IC Scientific Directors track and report gender and race/ethnicity data on a recurring basis. This committee was recently established (Spring 2018), and it intends to promote workforce diversity and inclusive excellence within the IRP. Such a strategy could be adopted as a model for extramural institutions. Additional demographic data, such as that reporting sexual orientation, gender identity, and disability type, could also be gathered.
- Even with strict standards requiring representation in hiring pools, people often find a way around them, and thus accountability is paramount. For institutional culture change to occur, institutions must be motivated to enhance diversity and promote inclusive excellence. Doing so requires explicit engagement of leadership.
- Through communication with institutional grantees via funding announcements and other vehicles, NIH encourages institutions to adopt inclusive excellence as a standard: This is being done on a small scale with NIGMS-funded T32 grants, which require that T32 grant recipients report progress in the area of diversity and address gaps. NIGMS also specifies in the [recently revised funding T32 announcement](#) that “programs should recruit faculty who are committed to training, mentoring, and providing supportive and inclusive research environments. Additionally, consideration should be given to recruiting program faculty from underrepresented backgrounds (NOT-OD-15-053), women, and faculty at different career stages (i.e. junior as well as senior faculty).”
- SWD should more aggressively share its resources and tools with the extramural community—for example, through academic channels that already reach academic structures and leadership (e.g. faculty development officers and chief diversity officers); these individuals can broker bidirectional communication between academia and NIH/SWD.

Provide more resources to NIH/SWD office

- Given its coordinating role, SWD struggles to reach NIH levers that can exact change. In many cases, gathering and analyzing data across NIH entities is a major challenge due to disparate methods used to collect and store data. Increased resources to gather, standardize, and evaluate data trans-NIH are sorely needed.
- SWD and the NIH Division of Biomedical Research Workforce (DBRW) in the NIH Office of Extramural Research should enhance collaboration to standardize, gather, evaluate, and disseminate data on workforce diversity with appropriate allocation of additional resources to implement this collaboration.
- Both a strength and a weakness of the SWD model is its decentralized nature. More resources to connect across NIH and extramurally funded institutions, through dedicated liaisons, would extend and strengthen SWD’s reach and impact.
- Each NIH IC should have a dedicated, high-level staff member that oversees diversity/inclusion. This person should have scientific credibility and respect and a direct line of communication with both the IC director and COSWD (Hannah Valantine). The position could encompass faculty development more broadly as a step to institutionalize diversity/inclusion as a key component of research excellence.
- Create workshops addressing data-driven approaches to diversity and publish the proceedings as a way of disseminating new ideas.

Next steps to implement recommendations 1, 6, 10:

- Establish a standard NIH reporting template for diversity, inclusion, and equity, based upon the NIH NEC template, for adoption by institutional units (divisions and departments) in compliance with applicable law (including the Privacy Act and the Paperwork Reduction Act); encourage that data collected is disaggregated by demographic characteristic, scientific discipline and other descriptors. Once established, NIH/SWD could provide benchmark data on institutional faculty demographics for comparisons (online via its website), to the extent permitted by applicable law (including the Privacy Act).

- To truly move the diversity “needle,” NIH must develop a range of strategies to motivate institutions to adopt inclusive excellence as an institutional standard.
- Consider ways to promote workforce diversity at senior leadership levels across all NIH ICs.
- Provide resources to SWD and DBRW for collaborations to enhance efforts to collect and evaluate diversity and inclusion data across NIH.
- Develop a prize or other incentive mechanism for institutions to advance the SWD Toolkit for broad use.

IV. Grant Funding

The original impetus for creating the COSWD and her office was the [2011 Ginther et al. report](#) describing racial (African-American/Black) inequities in funding, notably for the “career-gateway grant,” the NIH R01.

Recommendation 2: NIH should be more transparent about the diversity of applicants and recently funded grants and investigators.

Recommendation 12: NIH should consider reviewing and tracking funding outcomes of grant types including and beyond R01s (such as U01s) to develop and implement interventions that may improve opportunities for funding success for African-American/Black researchers who tend to favor translational, clinical, and community-based research.

Recommendation 13: NIH should analyze the impact that methodologies and institutional prestige have on review and funding outcomes for various grant types.

Discussion

Create a dashboard for assessing diversity by funding mechanism, across all ICs

- Transparency: data must be disaggregated to understand funding disparities at a granular level. Ideally, every IC would have a “dashboard” that exhibits funding by mechanism across groups (including by URG, gender, and additional demographic characteristics such as sexual orientation and gender identity). ICs directors should develop aspirational goals for the dashboard metrics. This type of analysis is very costly, and thus more resources are required to institute such tools either centrally (e.g. to enhance ongoing efforts at SWD or in DBRW) or in ICs.
- Another derivative of this concept is to publicize funding outcomes disaggregated (including by gender and race/ethnicity) to IC advisory councils each round (retrospectively).
- Various evaluation processes could be considered, including retrospective analyses, or, to the extent permitted by law and NIH policy, prospective analyses (e.g. commons IDs for trainee tracking), or mixed-methods evaluations. All these are labor- and cost-intensive.

Define what success looks like for NIH

- Which is a more important to NIH: losing a highly-trained individual from the “system” or not “capturing” talent early? This is a philosophical question that NIH must consider in its training investments, which span many years if not decades to reach fruition.
- To some extent, success is about taking risks, and NIH and its stakeholders in academia and elsewhere must share this risk.

Next steps to implement recommendations 2, 12, 13:

- Attain resources to develop diversity-related funding dashboards for use centrally and by ICs.
- Encourage ICs to establish diversity sub-groups of their advisory councils or at least, to review diversity of applicants and grantees on a recurring, retrospective basis.

Conclusion

The ACD WGD has built upon its 2017 recommendations, to provide granularity and actionable steps for consideration by the ACD. These include:

- Standardize and expand use of NIH-funded diversity supplements
- Create a funding announcement for faculty-level “training grants” designed to emulate successful models of cohorts
- Create a trans-NIH IRACDA-like funding announcement with broadened focus beyond teaching
- Create an institutional “matchmaking” award to convene stakeholders with a shared interest in workforce diversity and inclusion
- Ensure that all NIH IC leadership have a designated, high-level representative for scientific workforce diversity and inclusion who interfaces with IC staff and leadership, as well as with that IC’s advisory council
- Provide more resources to SWD and DBRW to facilitate data gathering and analysis, and coordination of evaluations, across NIH entities
- Create an NIH IC diversity-reporting template, in compliance with applicable law (including the Privacy Act and the Paperwork Reduction Act), that can be used for data toward developing and publicizing comparative diversity “score cards” and to serve as a national model for institutions and their individual units (divisions and departments)
- Develop and implement a dashboard representing IC-level funding data (disaggregated by gender and race/ethnicity)
- Host a national meeting on workforce diversity and inclusion approaches and institutional climate, and publish the proceedings
- Increase reach of NIH’s voice on scientific workforce diversity and inclusion through webinars, listservs with institutional diversity contacts, and enhanced dissemination of NIH SWD’s products including the Toolkit and future products to help institutions advance faculty diversity and inclusion
- Make connections with community colleges, tribal organizations, institutions for deaf and hard-of-hearing, and national organizations with missions to support diverse talent in the health professions pipeline (e.g., the Student National Medical Association and National Medical Association, the Latino Medical Student Association and the National Medical Hispanic Association, the Building the Next Generation of Academic Physicians, and others)

Realizing NIH’s goals for enhancing scientific workforce diversity nationwide requires diligence in making the case that diversity and inclusion contribute to research and institutional excellence. Implementation of the 2018 ACD WGD recommendations requires bold action, along with close and meaningful partnerships with NIH’s stakeholders in the public and private sectors.