

UC Irvine

UC Irvine Previously Published Works

Title

Fund Black scientists

Permalink

<https://escholarship.org/uc/item/4tz0f747>

Journal

Cell, 184(3)

ISSN

0092-8674

Authors

Stevens, Kelly R
Masters, Kristyn S
Imoukhuede, PI
et al.

Publication Date

2021-02-01

DOI

10.1016/j.cell.2021.01.011

Peer reviewed

Fund Black Scientists

-
Kelly R. Stevens^{1, #}, Kristyn S. Masters², Princess Imoukhuede³, Karmella A. Haynes⁴, Lori A. Setton³, Elizabeth Cosgriff-Hernandez⁵, Muyinatu A. Lediju Bell⁶, Padmini Rangamani⁷, Hana El-Samad⁸, Shelly Sakiyama-Elbert⁵, Stacey Finley⁹, Rebecca K. Willits¹⁰, Abigail N. Koppes¹⁰, Naomi Chesler¹¹, Karen Christman¹², Josephine Allen¹³, Joyce Y. Wong¹⁴, Tejal Desai⁸, Omolola Eniola-Adefeso^{15, #}.

¹ Departments of Bioengineering, Laboratory Medicine & Pathology, University of Washington, Seattle, WA

² Department of Biomedical Engineering, University of Wisconsin-Madison, Madison, WI

³ Department of Biomedical Engineering, Washington University in St. Louis, St. Louis, MO

⁴ Wallace H. Coulter Department of Biomedical Engineering, Emory University, Atlanta, GA

⁵ Department of Biomedical Engineering, University of Texas at Austin, Austin, TX

⁶ Departments of Electrical & Computer Engineering, Biomedical Engineering, and Computer Science, Johns Hopkins University, Baltimore, MD

⁷ Department of Mechanical and Aerospace Engineering, University of California, San Diego

⁸ Department of Biochemistry and Biophysics, University of California, San-Francisco, CA

⁹ Department of Biomedical Engineering, University of Southern California, Los Angeles, CA

¹⁰ Departments of Chemical Engineering and Bioengineering, Northeastern University, Boston, MA

¹¹ Edward Lifesciences Center for Advanced Cardiovascular Technology and Biomedical Engineering, University of California, Irvine, CA

¹² Department of Bioengineering, University of California, San Diego, CA

¹³ Department of Materials Science and Engineering, University of Florida, Gainesville FL

¹⁴ Department of Biomedical Engineering, Boston University, Boston MA

¹⁵ Department of Chemical Engineering, University of Michigan, Ann Arbor MI

Corresponding Authors

We are at a historic moment in time: a mainstream awakening to the pain that stems from racial injustice. While Black voices have long lamented racial inequity and the disparities arising from it, scientific communities have only recently acknowledged that our own policies and practices continue to promote this injustice^{1,2}.

To address racial injustice in our profession and society, we established a national network of 250+ women faculty in biomedical engineering from all academic ranks, including Chairs, Deans, and distinguished scientists, such as the few women of color elected into the National Academies. Over the past few months, we have exchanged >24,000 Slack workspace messages discussing racial inequities that pervade our profession. Throughout these discussions, one issue keeps rising to the top.

Our Black colleagues express grief, sharing that it is nearly impossible for them to obtain sufficient NIH funding for their research laboratories. These human experiences are, of course, backed by years of data.

The first study documenting racial disparity in NIH funding hit the field like a shockwave in 2011³. This study showed that award probability for applications by Black PIs was ~55% that of White PIs of similar academic achievement over council years 2000-2006³. NIH scrambled to study potential reasons for this injustice^{4,5}. We, as scientists and engineers wrote editorials, and we promised to do better. Yet, over a decade later, this gap persists^{5-7,2}. In Council years 2014-2016, Black applicants' award rates remained at ~55% of those for White PIs (Fig 1A)⁵. While we continue to nit-pick about the reasons for this disparity^{5-7,2}, one fact remains widely agreed upon - the disparity is real.

Why does this matter? Promotion and tenure committees frequently use research grants as an indicator for long-term viability of a research program. Thus, the disparity in NIH funding, particularly the lack of an R01 grant, leads to failed tenure cases for Black faculty in biomedical disciplines⁸. Others burn out and exit the academy before reaching the tenure threshold⁹. We thus ask our non-Black colleagues to consider being in our Black colleagues' shoes for a moment: Imagine spending *twice* the amount of time grant writing^{5-7,2}, while also performing substantially more service¹⁰. This excessive burden no doubt leaves our Black colleagues less time to do research, publish papers, gain exposure, train and inspire diverse students, and attain the promotions and positions needed to achieve the highest levels of academic power^{8,5-7,2}.

To add salt to this wound, we worry that NIH does not fully understand the critical deleterious impact of this disparity. For example, we applaud the NIH Common Fund FIRST program, which will commit \$241 million to recruit new faculty committed to inclusive excellence. Yet, any new Black researcher will simply be set up to fail if NIH does not empower them to succeed by also addressing R01 racial funding disparity.

Now. At least 10 editorials have drawn attention to NIH racial funding disparity^{2,6,7}, with no sign of when it will end. Meanwhile, our Black colleagues continue to be disenfranchised. We need radical solutions that produce racial funding equity *now*.

National Institutes of Health

The NIH Director and leadership must recognize that its previous approaches, most of which have focused on filling the "pipeline" without simultaneously addressing our profession's systemic racism, have failed. NIH must change course.

1. Explicitly state that racism persists in the U.S. research enterprise and that it must be expelled

Black voices have long lamented the racism in this country and the countless health disparities arising from it. We refer readers to the thousands of reports, studies, and personal introspections written on this topic^{6,7,11}. However, the silence from NIH on this topic remains deafening.

10,234 of our faculty colleagues, including the authors here, recently signed a statement acknowledging the presence of systemic racism in academia.¹ If racism is present in academia, how can it not be present in NIH grant review and research, which are performed by academics?

We urge NIH to release a public statement signed by the NIH Director which:

- Acknowledges that racism persists in the U.S. academic research enterprise, and that it is wrong.
- Describes metrics, a timeline, and funds committed to how NIH will achieve the goal of both building and equitably funding a scientific workforce that reflects the diversity of the US population. After all, *all* Americans pay the tax dollars that fund NIH. Inequitable distribution of these dollars is discrimination.

Civil rights pioneer Mr. Fred Gray, who represented Mrs. Rosa Parks, Dr. Martin Luther King, Jr., and the men of the deadly Tuskegee trial, recently reminded us of the critical importance of issuing such a proclamation from all levels of leadership:

"The question before us today is where do we go from here... First, we must recognize that racism and inequality is alive and well and it is wrong. That declaration needs to come from the top: The White House, The Congress, the United States Supreme Court...if the heads of our Institutions of our learning, and if the heads of our federal government, our cities, our counties, our professional organizations, will come out with a loud voice saying that "racism and inequality are wrong!"...That is the first step."

2. Institute policies to immediately achieve racial funding equity

Interestingly, solutions to similar funding disparities have been demonstrated elsewhere by NIH. The best example is the NIH Early Stage Investigator (ESI) Program policy¹², which funds additional R01 applications from early-stage investigators with scores above the funding pay-line. This program has successfully "leveled the playing field" by supporting early-career scientists at a success rate similar to established investigators. We remind NIH and our colleagues broadly of the first line stated as background on the NIH Early Stage Investigator Policy website:

Fostering the creative discoveries and innovative research that will protect and improve health requires NIH to take steps to promote the growth, stability, and diversity of the biomedical research workforce.

-- NIH Early Stage Investigator Policy (first full sentence)¹²

We ask NIH, are race and ethnicity not considered diversity? In the words of our colleague Dr. Manu Platt⁶:

Be careful with responding, one answer is racist and the other is not⁶.

A second example is the NIDDK and NHGRI R21 program, PAR-19-222, which provides support for New Investigators from diverse backgrounds, including from groups nationally underrepresented in biomedical and behavioral research. We applaud NIDDK and NHGRI for this fantastic program. Unfortunately, as an R21 program supported by only two Institutes, this program can make limited impact.

NIH must institute an "equity" policy or program for Black investigators. This must be similar in design to the ESI policy, or to the PAR-19-222 program but at the R01 level and for all NIH Institutes and all PI careers stages. This policy or program must be funded to achieve equity, that is, to entirely eliminate racial funding disparity. We estimate that NIH would need to reappropriate only ~0.07% of its annual budget to achieve this program to achieve racial equity (Fig 1A and legend). Procedural roadmaps for similar racial equity initiatives exist in other disciplines, why not at NIH?

We understand that such a policy or program may cause concern for some racist members of our scientific community. Indeed, the backlash from loud and privileged members of the majority is what has enabled racism to persist so long¹¹. Should American institutions quake at the racism from some members of our community? No.

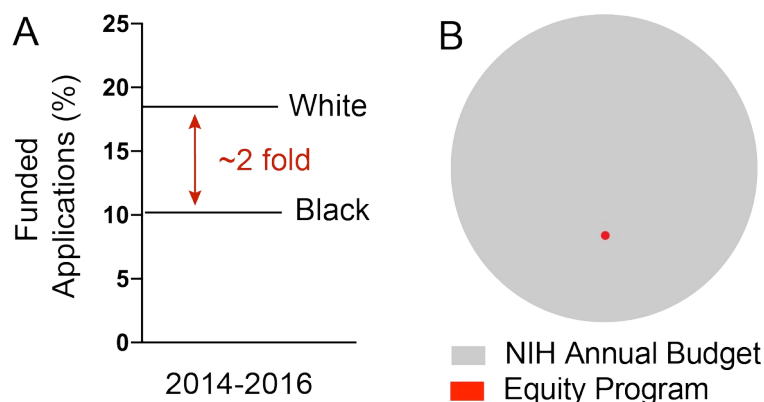


Fig 1. NIH R01 racial funding disparity. (A) For R01 applications from 2014-2016, the overall award rate was 10.2% for Black PI's and 18.5% for White PI's⁵. (B) Circle areas proportionally represent the amount of funding in the NIH annual budget (gray, \$41.68 billion in 2020) *versus* that needed to achieve racial funding equity (red, \$32 million). Our ~\$32 million estimate is derived as follows: The NIH Deputy Director for Extramural Research reported 35,085 R01 equivalent applications were submitted in 2019 and average award size of funded applications was \$548,390. Of the awards submitted, previous studies have shown that ~2% of applicants were Black⁵. 10.2% (Black) and 18.5% (White) award rates⁵ would yield 72 and 130 funded applications, respectively, which is a difference of 58 funded applications. This R01 equivalent racial funding disparity amounts to ~2 applications per Institute and ~\$32 million in research funding.

3. Make racial/ethnic diversity score-driving criteria, and prioritize diverse teams for funding.

Creativity and innovation blaze new paths to discovery and lay at the core of everything we scientists value. We firmly support the first major goal of the NIH, as stated prominently on its Mission and Goals webpage:

"To foster fundamental creative discoveries, innovative research strategies, and their applications as a basis for ultimately protecting and improving health..."
--NIH Mission and Goals (first stated goal)

Yet, NIH practices are discordant with this goal. Study after study have shown that diverse teams generate the most creative, innovative, and impactful solutions and science^{13,14}. Why then, is diversity of the "Investigator team" not a scorable criterion for funding?

Be careful with responding, one answer is racist and the other is not⁶.

To foster innovative strategies that improve human health, diversity must be woven into the fabric of everything that NIH, and each of us as scientists, do. Diversity should not be viewed as a separate department, a separate institute, or a separate initiative. If we are truly committed to the most creative discoveries and innovative research strategies, diversity must be scorable and prioritized for funding, period.

In fact, the practice of prioritizing diverse teams already exists in many governmental entities at the federal and state levels. As just one example, in the awarding of federally-funded contracts, large companies bidding for jobs are encouraged to include partnership with a Disadvantaged Business Enterprise (DBE) to remedy ongoing discrimination in federally-assisted transportation contracting.

- Diversity of the Investigator team must be a score-driving criterion in NIH grant review. This includes race/ethnicity and other forms of diversity such as gender, sexual orientation, and disability.
- Until there is no NIH racial funding disparity, all applications from Black PIs **must** be discussed. These applications should be automatically slated for discussion, prior to the review meeting.
- Program Officers/Program Directors (POs/PDs) should be encouraged and empowered to reevaluate grants of Black PIs that score above the funding pay-line and bring these grants forward to Council for funding. An average of only ~2 additional R01 applications from Black PI's would need to be funded per Institute to achieve racial equity (Fig. 1).

4. Train and empower NIH staff, grant reviewers, and grant recipients to recognize racism and stop it.

Dr. Martin Luther King, Jr. once said, *"In the end, we will remember not the words of our enemies, but the silence of our friends."* The common act of "looking away" to avoid discomfort upholds racism¹¹. Silence is complicity. NIH must therefore:

- Ensure that the scientific workforce including NIH SROs and POs/PDs, Study Section Chairs, as well as NIH grant reviewers and grant recipients are trained, empowered, and strongly encouraged to both recognize, respond to, and stop racism and other forms of bias on review panels.
- Create efficient mechanisms for reporting racist or biased conduct during and after review panels.
 - Develop a standardized policy to remove reviewers with a history of offenses from the reviewer pool.
 - Publicize policies, offenses reported, and NIH follow-up in annual reports.
- Include an NIH “ambassador” trained in racism on all review panels. The ambassador would ensure compliance and consistency of “best practices” across study sections (e.g., fairly drawn discussion lines, equitable grant discussion ratios based on diversity metrics such as race/ethnicity and gender prior to panels, inclusion of Black faculty on panels). The ambassador would observe dialogs and intervene and mediate when racism or bias occurs. Reviewers should be enabled to communicate (openly, privately, or anonymously) with the ambassador during and after each panel. Issues raised by ambassadors must be acted upon in the panel and later by NIH as above.
- Include a module on recognizing racism and stopping its negative impact in the mandatory Responsible Conduct of Research (RCR) training.

5. Include more Black faculty on study sections.

Minority voices and opinions will always be in the minority in a democratic “vote-based” system. This challenge is compounded in academic biomedicine, where Black faculty are ~6-fold underrepresented relative to the U.S. population⁵. As such, we must do everything in our power to actively recruit the full involvement and inclusion of Black voices at every level. Otherwise, we are stacking and restacking the deck against our Black colleagues and the health of Black Americans.

- Include more Black PIs on study sections. Institute a minimum number of Black reviewers that must be present on each panel, and publish a timeline over which NIH will ensure this number proportionally represents the US population. Service on an NIH panel is universally viewed as career enhancing and prestigious. Various BlackInX lists have been created to identify Black Investigators, including in searchable database formats (e.g., citeblackauthors.com).
- Remove any requirement *or preference* for having previous NIH grant recipients serve on review panels. Any such practice assumes grant funding is administered equitably, which it is not. Anyone qualified to submit grants as a PI, including junior PI’s, is qualified to review these grants.

6. Fund studies to assess the impact of racism in NIH grant review and research

NIH must invest in understanding the impact of racism in biomedical research at multiple levels. Such studies should be performed in parallel with and not instead of, or prior to, immediate dismantling of disparity.

- Fund studies to assess differential practices and racial disparity data between NIH and the National Science Foundation (NSF), as well as “matching criteria”⁵ that affect the disparity gap.
- Record and publish funding and triage rates across racial/ethnic, gender, sexual orientation, disability, rank, and other groups. All groups must be included in each study, as disparities compound for those who identify in several groups (“intersectionality”, such as Black women).

- Ensure that differential funding paylines or topic areas do not contribute to grant funding disparity. NIH funding must be re-distributed to achieve equity. Anything less is discrimination.

National Institutes of Health

1. State that racism persists and must be expelled.
2. Institute policies to achieve racial funding equity now
3. Make diversity score driving-criterion
4. Train and empower science workforce to recognize and stop racism
5. Include more Black faculty on study sections
6. Fund studies to assess the impact of racism in research funding

Scientific Reviewers

1. Score grants of Black faculty well
2. Rescue grants of Black faculty so they are discussed
3. Consider diversity when scoring Investigator team and Innovation
4. Let our Black colleagues speak, and listen to them, on panels
5. Learn about racism, and stop letting it pass

Fig 2. Fund Black Scientists. Action for NIH and scientific colleagues

Scientific Reviewers

All of us want racism to be over, all of us would like to see inequality to be over, but...we want somebody else to do it. But if this is going to happen, each one of us individually must do our part...

-Mr. Fred Gray, *Biomedical Engineering Society Annual meeting, 2020*

1. Fund Black scientists

Faculty colleagues, over the last few decades we have invested countless hours of training and outreach to diversify the scientific workforce. We have done this because we too have attributed the lack of diversity in science to a “pipeline problem”. Yet, we have minimally moved the needle and, in some sense, have regressed³².

We respectfully suggest that it is time for us to acknowledge that we – *yes each of us, including many of the authors here* – have unintentionally contributed to this problem. To support this statement, we provide a few puzzle pieces here:

We judge CVs and resumes differently based on the name of the applicant alone, even if these CVs are identical, with racial and gender bias^{11,15}. Many studies have shown this^{11,15}. We ask – what might this suggest about our judgment of our NIH biosketches?

We cite the equally relevant papers of Black authors, especially Black women, less frequently, directly affecting metrics such as h-index and publication impact¹¹. Many studies have shown this¹¹. We ask – what might this mean when we give a PI with a high h-index or impactful publication a “pass” when reviewing their grant?

These examples are just the beginning^{1,2,11,15}. We can no longer ignore that systemic racism is alive and well in our profession^{1,2,11,15,7,6}.

Scientific colleagues, let us each use our voice and actions to now overcome our profession’s racism, and serve as antiracist agents of change. There is power in numbers.

- Score grants of Black faculty well. *Score them well!**⁶
- Rescue grants of Black faculty to ensure they are discussed*
- Consider diversity as a factor when scoring the Investigator team and Innovation*
- Give our Black colleagues the time and space to speak on review panels. Respect their opinions.

*When we review, score, and/or rescue applications, our rationales must be based on the current “score driving” criteria: (see: <https://grants.nih.gov/grants/peer/critiques/rpg.htm>). Innovation is one of the score-driving criteria. As noted above, diverse teams generate more innovative work.

2. Learn about racism, and stop letting it pass.

- Learn what racism is. We respectfully urge each and every one of our scientific colleagues to make time to learn about topics such as “systemic racism”, “racism”, “whiteness”, and “antiracism”.
- Call out and stop all racist statements you hear in review panels and elsewhere. Do not let racist comments pass. Silence is complicity. Support and amplify comments made by others calling out racism.
- Find a Black faculty collaborator. Or better, a collaborator, co-author, co-PI, and friend.

A call for collective leadership and action

While immediate and radical action by NIH is desperately needed, the collective actions by scientists and other entities have a vital role to play as well. We highlight and thank Genentech for providing one example of innovative leadership by awarding \$500,000 to the University of Michigan and University of Washington to create “Genentech Research Funding Awards”, which will be administered to Black faculty to help offset NIH racial funding disparity.

We urge each of us – the NIH, every one of our scientific colleagues, industry partners, community partners, and Universities – to add our voices and *take tangible action now*.

We must stop devaluing scientists and extinguishing careers, and instead demonstrate that we truly and deeply value innovation and creativity.

Fund Black Scientists.

Fund. Black. Scientists.

#fundblackscientists

References

- 1 Cell Editorial, T. Science Has a Racism Problem. *Cell* **181**, 1443-1444,(2020).
- 2 Barber, P. H., Hayes, T. B., Johnson, T. L., Marquez-Magana, L. & signatories. Systemic racism in higher education. *Science* **369**, 1440-1441,(2020).
- 3 Ginther, D. K., Schaffer, W. T., Schnell, J., Masimore, B., Liu, F., Haak, L. L. & Kington, R. Race, ethnicity, and NIH research awards. *Science* **333**, 1015-1019,(2011).
- 4 Hoppe, T. A., Litovitz, A., Willis, K. A., Meseroll, R. A., Perkins, M. J., Hutchins, B. I., Davis, A. F., Lauer, M. S., Valantine, H. A., Anderson, J. M. & Santangelo, G. M. Topic choice contributes to the lower rate of NIH awards to African-American/black scientists. *Sci Adv* **5**, eaaw7238,(2019).
- 5 Erosheva, E. A., Grant, S., Chen, M. C., Lindner, M. D., Nakamura, R. K. & Lee, C. J. NIH peer review: Criterion scores completely account for racial disparities in overall impact scores. *Sci Adv* **6**, eaaz4868,(2020).

- 6 Platt, M. O. We exist. We are your peers. *Nat Rev Mater* **5**, 783-784,(2020).
- 7 Dzirasa, K. Revising the a Priori Hypothesis: Systemic Racism Has Penetrated Scientific
Funding. *Cell* **183**, 576-579,(2020).
- 8 Fang, D., Moy, E., Colburn, L. & Hurley, J. Racial and ethnic disparities in faculty promotion
in academic medicine. *JAMA* **284**, 1085-1092,(2000).
- 9 Cropsey, K. L., Masho, S. W., Shiang, R., Sikka, V., Kornstein, S. G., Hampton, C. L.,
Committee on the Status of, W. & Minorities, V. C. U. S. o. M. M. C. o. V. C. Why do faculty
leave? Reasons for attrition of women and minority faculty from a medical school: four-
year results. *J Womens Health (Larchmt)* **17**, 1111-1118,(2008).
- 10 Hare, H. E. Service Work of Underrepresented Faculty. UCLA. ProQuest ID:
Hare_ucla_0031D_17194. Merritt ID: ark:/13030/m5130qh4. Retrieved from
<https://escholarship.org/uc/item/6pr0b5jz>.(2018).
- 11 Henry, F., Dua, E., James, C.E., Kobayashi, A., Li P., Ramos, H., Smith, M. The Equity Myth:
Racialization and Indigeneity at Canadian Universities. *UBCPress, Vancouver, Toronto*,
(2017).
- 12 Policy, N. E. S. I. <https://grants.nih.gov/policy/early-investigators/index.htm>.
- 13 Freeman RB, H. W. Collaborating with people like me: Ethnic co-authorship within the US
(No. w19905). Available at www.nber.org/papers/w19905. .
- 14 Hofstra, B., Kulkarni, V. V., Munoz-Najar Galvez, S., He, B., Jurafsky, D. & McFarland, D. A.
The Diversity-Innovation Paradox in Science. *Proc Natl Acad Sci U S A* **117**, 9284-9291,
(2020).
- 15 Eaton, A., Saunders, J., Jacobson, R., West, K. How Gender and Race Stereotypes Impact
the Advancement of Scholars in STEM: Professors' Biased Evaluations of Physics and
Biology Post-Doctoral Candidates. *Sex Roles* **82**,(2019).