



September 29, 2017

The following comments to the National Academies of Sciences, Engineering and Medicine Committee on the Next Generation Researchers Initiative are submitted on behalf of the American Physiological Society (APS). The APS was founded in 1887 to advance physiological research. Our membership consists of nearly 11,000 research scientists throughout the world who study biological processes that sustain life. Our U.S. members work in academia, industry, and government where they seek to understand human and animal diseases as well as biological traits that enable animals and humans to adapt to their environment. We appreciate the opportunity to provide input on your study of workforce issues.

I. Level, Sources, and Stability of Research Funding

The APS agrees that NIH would be in a better position to maximize its resources if it were given multi-year appropriations and flexible budget carry-over authority. Under the current system, NIH and other research agencies must delay planning and operations for the next fiscal year until Congress approves annual appropriations legislation. When this process is delayed—as has happened frequently in recent years-- NIH and other research agencies have to reduce funding for continuing grants and delay decisions on new grant applications. This contributes to instability in extramural research careers and delays scientific progress.

NIH should prioritize investigator initiated research, regardless of funding mechanism. NIH also needs to have maximum flexibility to apply resources to areas of scientific opportunity, whether that funding is provided through the Common Fund, New Innovator Awards or research project grants.

APS appreciates the efforts that NIH has undertaken recently to support early stage and early career established investigators. Evaluating the efficacy and success of these programs will be important as future decisions about funding policy are made. In 2017 NIH considered using a grant support index to limit the amount of resources an individual investigator could receive at one time. While the policy was abandoned before details were fully worked out, APS supports the idea of lowering the pay line for investigators with multiple awards. For example, if the pay line for a given IC is 10%, grant applicants who already hold three awards might be subject to a 5% pay line. This will make it possible for resources to be more widely distributed throughout the research community, while still allowing an opportunity for the top meritorious proposals to receive funding.

APS agrees that universities should be encouraged to update and broaden criteria for faculty promotion and tenure. Using federal grants as the only benchmark of success is problematic, particularly when pay lines are as low as they have been in recent years. With success rates in the teens, successful funding may not accurately reflect scholarship. We also note that studies have shown implicit bias in review of grants and publications, meaning that underrepresented populations are consequently at a disadvantage in the tenure and promotion process. This should also be addressed.

II. The Scope of Grant Award and Review

Extending the length of support for research project grants is one way to improve stability for researchers in the extramural community. This is especially applicable at this time when many institutes have cut grants to four years. This means that investigators must begin thinking about a renewal application around, or even before, the three year mark on these grants. Grants that are at least five years will yield more scientific productivity and security for investigators, who will be relieved of the constant pressure of fund raising. NIH has already started to consider this approach with the recent pilot programs that support researchers' programs of research, rather than individual research projects, and provide funding for a longer period of time. An example of this is the MIRA program at the NIGMS, which is still being evaluated. If that program and similar efforts at other ICs prove successful in helping researchers obtain and sustain research funding, they should be expanded.

The K award program, including the K99/R00 award, is already focused on helping early career researchers establish independent research programs. Before altering the program, it should be evaluated to determine whether recipients have been able to successfully obtain subsequent research grants after completion of their award.

APS recommends that NIH consider increasing the funding for R21 exploratory grants to \$200,000 per year for two years. This would provide a relatively low-cost mechanism for supporting innovative research. We also would like to see all institutes and centers, including NIDDK and NHLBI, offer these high risk/high reward grants to promote innovation in across all fields.

III. Training, Mentoring and Transparency

The APS agrees that universities should be transparent regarding the length of training, salary and benefits and career outcomes for their trainees. Ideally this information should be available to program applicants before they enroll so that they can make informed decisions about their education.

Another way to reduce the reliance on trainees in the scientific workforce is to increase support for staff scientists. This would also have the effect of opening up an additional career direction for those with research training who do not wish to run their own independent research program.

APS also recommends that the research community move away from a system where graduate students are expected to complete post-doctoral fellowships after completing their doctoral degrees. While those fellowships may be necessary to help some trainees develop critical research skills, for others they may not help further their chosen career path. The scientific community should work to change the expectation that post-doctoral fellowships are the default step after graduate school.

IV. Underrepresented Populations

The APS supports the recommendation to gather demographic data and outcomes for all trainees regardless of the source of support. The data gathered should also include measuring how many physician-scientists continue to engage in research after completing their training, and if possible also attempt to determine how many international trainees remain in the United States after graduation.

The APS recommends that actions be taken to level the playing field for underrepresented populations in the sciences. Studies have shown bias in the review processes for grants and publications, and one way to address this problem is to provide training for reviewers. Increasing awareness of implicit bias has been shown to help reduce it.

One way that NIH could immediately improve matters is to change the policy for awarding grant supplements to support underrepresented persons on a research grant. Current policy stipulates that an underrepresented person being supported on an R01 grant is not eligible to apply for and receive a supplement on that same grant in the future. This has the effect of preventing PIs from recruiting underrepresented persons into a lab unless there is a separate source of funding other than the R01 to cover their initial salary while applying for a supplement.

Providing better support for post-doctoral fellows, both through increased salary and other policy changes, could help attract and retain a more diverse group of scientists. Of particular note, providing more family friendly policies could help retain scientists who are raising young families while completing their research training. Family friendly policies could include approaches like providing affordable daycare. This would be a big step forward to support post docs with young children who may leave science due to exorbitant day care costs.

The APS also notes that in recent years many of the policy changes that NIH has implemented have improved support for scientists at major research institutions but may not have led to equal improvement for scientists at smaller researcher universities. These smaller institutions also tend to have higher concentrations of students from underrepresented populations. Therefore finding ways to increase support for these institutions would also contribute to the goal of increased diversity in the scientific workforce.