



American Society of Agronomy • Crop Science Society of America • Soil Science Society of America

5585 Guilford Road, Madison WI 53711-5801 • Tel. 608-273-8080 • Fax 608-273-2021  
www.agronomy.org • www.crops.org • www.soils.org

To: JCORE@ostp.eop.gov  
NSTC Executive Director, Chloe Kontos  
Re: **RFI Response: American research environment**

Dear Ms. Kontos,

The American Society of Agronomy, Crop Science Society of America, and Soil Science Society of America represent more than 18,000 scientists in academia, industry, and government. We support more than 13,500 Certified Crop Advisers (CCA), and more than 700 Certified Professional Soil Scientists (CPSS). We thank you for the opportunity to provide comments on the American research environment.

### **Research rigor and integrity**

The Societies do not feel that research replicability is a significant challenge worthy of OSTP's attention. Because peer-reviewed research journals have requirements for detailing methods so that research can be replicated, simply replicating an experiment is not usually a matter of integrity. The editorial staff of a reputable publisher, and the peer-review process they maintain, however, is essential and should be preserved.

The reproducibility of experimental findings is also often less about integrity or scientific conduct than simply the challenge of working on the edge of what is known – a variety of unknown factors can influence why different results may come from what seems to be the same experiment. More important is what happens next. If the results of the repeated experiment are very different, then those results should be published and often are. But negative or, worse, non-significant results are rarely published or otherwise available to the research community. This can lead to multiple researchers blindly attempting the same experiment again and again, wasting resources.

There are journals specifically created to publish negative data as a service to the community. In 2018, the American Society of Agronomy and Crop Science Society of America began publishing the *Agrosystems, Geosciences & Environment* journal to fill this need. This high-quality, peer-reviewed journal focuses on providing a publishing platform for negative results, time-limited studies, and regional findings. But non-significant data is more difficult to capture. The Societies suggest the creation of study registries, which researchers would be required to use and update if they have received a federal grant. If the research is successfully published, then a link to the publication could be provided, but if the study yielded results too weak to publish, or if the research needed to be taken in a different direction, that information is crucial for other researchers considering the same line of study. All research should be published in some form, and the Societies support open access, after an embargo period, but federal agencies need to back up open access rhetoric with funding to pay for it.

### **Coordinating Administrative Requirements for Research**

The Societies are supportive of policies that reduce the burdens associated with application requirements, such as the development of a common application for proposals, perhaps with the identity of the researcher hidden. More time spent preparing grant applications, for example to keep a

graduate student funded, is less time spent on more innovative work, and blind auditions, for example in professional orchestras, has greatly increased the diversity of professional musicians.<sup>1</sup> But although a common, streamlined proposal submission process and blind reviews of the best science, not scientists, are steps in the right direction, more can be done to diversify the researchers being funded and to improve the field of research.

Research is risky. Scientists attempt to explore the unknown, and there may be failures. Federal agencies should be less concerned with funding “safe” research and more interested in taking risks, risks on ideas and risks on people. High-risk ideas flounder when grants are only awarded after preliminary data are found. Preliminary work affords the funders a small guarantee that further research will be fruitful. While that seems like a sound precaution, the effect is to make all research less risky. But without taking big risks, there is a smaller likelihood of discovering something truly groundbreaking and different. And preliminary work is difficult to perform before getting a grant in the first place. One solution is for federal agencies to fund many more small, innovation grants, at \$100,000-\$150,000 per year, to explore risky topics. Interdisciplinary research and public-private partnerships, for example those supported by the Foundation for Food and Agriculture Research, are other ways to achieve high-reward objectives but that leverage partnerships to reduce the overall riskiness for each funder.

Federal agencies should also aim to fund researchers who have not had the opportunity to establish themselves as scientific “safe bets.” The Societies are not advocating for agencies to cap grants to highly successful labs, but it must be acknowledged that earlier career scientists cannot compete on a level playing field with more established researchers. We suggest that federal agencies allocate funds specifically for early and for mid-career scientists and for graduate students. For example, USDA’s AFRI program should double its budget for direct funding for graduate research and programs from 1.5 to at least 3 percent of its research budget. AFRI’s individual investigator grants may provide funding for student work, but their two to three-year duration is too short, the awards too small, and the success rate too low to maintain graduate student interest and involvement. Agronomy, Crop, and Soil Science departments lose good students to other disciplines because they cannot guarantee reliable research positions, and a diversity of students with their own funding may feel safer and more likely to stay in science if they are not dependent on a single principal investigator for their future in science.

### **Research Security**

The Societies are committed to maintaining an open academic and idea marketplace; researchers benefit greatly from international collaborators. It must be acknowledged that such an ideal may leave the research community vulnerable to international science espionage. However, it is not feasible for researchers to collect every pertinent piece of information about a collaborator or foreign graduate student, nor is it possible to keep them under constant surveillance. Academic institutions can work in tandem with the State Department to vet foreign collaborators, but vetting cannot be so time consuming that research opportunities pass while a potential collaborator is under review nor should it be so general as to exclude or impede collaborations with scientists of a particular nationality.

Common policies regarding foreign funding and influence across federal, grant-making agencies would help researchers and academic institutions identify and respond to potential scientific espionage. A common research funding application, for example, mentioned above to reduce the time-burden associated with applying for grants across federal agencies, could also be used to identify foreign

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<sup>1</sup> Goldin, Claudia, and Cecilia Rouse. "Orchestrating impartiality: The impact of "blind" auditions on female musicians." *American economic review* 90.4 (2000): 715-741.

financial support. These disclosures would help to identify researchers likely to be sending intellectual property abroad. Further, a standard policy across federal, grant-making agencies banning participation in foreign talent recruitment programs from those receiving federal grants would help clarify which activities are unacceptable.

These policies would not necessarily prevent a bad actor from taking money from a foreign government and lying about it, but it would separate out researchers who may not believe their actions to be unethical. It may also empower academic institutions to investigate suspicious activity, knowing that any investigator receiving foreign money from, say, a talent recruitment program would be ineligible for any federal grants.

Lastly, federal grant-making agencies should each have compliance officers in charge of enforcing these policies. Connected across agencies and in regular contact with academic institutions, these employees would work together, establish a community of practice, and monitor and safeguard the nation's intellectual property.

### **Safe and Inclusive Research Environments**

A safe and inclusive research environment begins when people committed to the idea of fostering such an environment receive the regular training and constant support needed to make it a reality. Federal agencies should encourage universities to provide implicit bias training for faculty, post-doctoral researchers, and students to begin building awareness of what a safe and inclusive environment is.

Additionally, the Federal government should encourage and reward culturally responsive mentorship programs, which can positively engage a more diverse group of students in STEM fields. And because there is a gap between what is known to be effective in mentorship and what is often practiced in academia, programs should include scientifically-based best practices that result in “intentional, inclusive, and effective” mentorship, as reported by the National Academies of Sciences, Engineering and Medicine.<sup>2</sup> For example, funding agencies could require mentorship education and mentoring plans in grant applications, with required reporting of outcomes and diversity metrics.

Agricultural institutions may confront extra challenges creating inclusive research spaces because so many are located in small, rural communities, which are less diverse than suburban or urban places.<sup>3</sup> This fact of geography can lead to a smaller number of diverse candidates applying to fill faculty and other research positions and to fewer diverse candidates accepting such positions when offered. New faculty of color can and should be supported despite a less diverse community at large, and universities can use aggressive, active recruitment strategies for minority and women candidates. One such strategy is dual hiring, since small cities are less able to support two professionals and women are more likely to be in dual career relationships than men<sup>4</sup>.

Hiring minority and women candidates is just the first step. To create a safe and inclusive space that retains these valuable members of the research community, universities need to eliminate policies or

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<sup>2</sup> National Academies of Sciences, Engineering, and Medicine. 2019. *The Science of Effective Mentorship in STEMM*. Washington, DC: The National Academies Press. <https://doi.org/10.17226/25568>.

<sup>3</sup> <https://www.pewsocialtrends.org/2018/05/22/demographic-and-economic-trends-in-urban-suburban-and-rural-communities/>

<sup>4</sup> Schiebinger, Londa L., Andrea Davies Henderson, and Shannon K. Gilmartin. *Dual-career academic couples: What universities need to know*. Michelle R. Clayman institute for gender research, Stanford University, 2008.

traditions that are known to be biased. For example, departments could eliminate the use of student evaluations in making tenure, compensation, and employment decisions,<sup>5</sup> considering students are generally not taught how to appropriately critique their professors and are likely to base their scores on gender or race-related factors.<sup>6</sup> There also needs to be infrastructure in place to support a diversity of researchers, such as nursing mother's rooms and affordable health services.

Thank you for your attention to these important issues facing the scientific research community. The Societies look forward to working with the National Science and Technology Council and Office of Science and Technology Policy to create a more robust and responsive research environment.

Sincerely,

A handwritten signature in black ink, appearing to read 'N. Goeser', with a stylized flourish at the end.

Nick Goeser, CEO  
American Society of Agronomy  
Crop Science Society of America  
Soil Science Society of America

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<sup>5</sup> Mitchell, Kristina MW, and Jonathan Martin. "Gender bias in student evaluations." *PS: Political Science & Politics* 51.3 (2018): 648-652.

<sup>6</sup> Deo, Meera E. "A better tenure battle: fighting bias in teaching evaluations." *Colum. J. Gender & L.* 31 (2015): 7.