COMMITTEE ON
SCIENCE, SPACE, & TECHNOLOGY
Lamar Smith, Chairman

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Statement of Chairman Lamar Smith (R-Texas)

National Science Foundation Part II: Future Opportunities and Challenges for Science

Chairman Smith: Thank you, Chairwoman Comstock. And welcome to our witnesses.

The American Innovation and Competitiveness Act, or AICA, the last bill from the 114th Congress signed into law, took several steps to maximize the nation's investment in research. It assures taxpayers that they will get their money's worth from National Science Foundation (NSF) scientific research projects.

The law included:

1. An explicit national interest requirement embedded permanently in NSF's merit selection process;

2. A requirement for NSF to justify in writing and in non-technical terms how each project that it funds meets the highest standards of scientific merit and the national interest;

3. Reforms to improve NSF's financial controls and oversight for major research facility construction, and prevent incidents, like the one at NEON, that resulted in a nine-figure loss on this one project; and

4. A requirement for NSF to take additional steps in response to proven instances of research fraud.

At our first hearing on NSF two weeks ago, NSF Director France Córdova told us about initiatives the agency continues to take to move forward in these areas.

We look forward to regular updates from NSF about its rapid implementation of the national interest criteria, accountability standards, and financial management reforms.

As NSF nears the 70th anniversary of its founding, we must ask, how does NSF best meet its opportunities and challenges over the *next* 70 years?

Since its creation in 1950, NSF has served a mission that helps make the United States a world leader in science and innovation. But the fields of science and technology consistently change.

To meet these challenges, NSF must be as nimble and innovative as the speed of technology development, and as open and transparent as information in the digital age.

These are not easy tasks for any government organization. I hope to hear how NSF keeps up with the pace of rapidly evolving science as well as recommendations for how the Foundation can do better.

One challenge I would like to take a moment to highlight is research reproducibility.

Reproducibility addresses and can prevent fraud and poorly designed and executed research. Unfortunately, there is evidence of the increasing frequency of non-reproducible experiments, particularly in certain fields of science.

A recent survey by *Nature* magazine found that more than 70% of researchers have tried and failed to reproduce another scientist's experiments, and more than half have failed to reproduce their own experiments. Additionally, over half of the researchers surveyed called it a "significant crisis" for science.

That should be of concern to every scientist and advocate for science. If a critical mass of scientists and research becomes untrustworthy, Americans may soon be more skeptical about the science coming from our science agencies.

As an illustration, there is the recent case of two highly regarded social scientists who conducted a project aimed at linking political ideology to mental illness.

The researchers concluded that conservatives were much more likely to manifest a personality pattern typified by aggressiveness and interpersonal hostility than liberals.

However, this conclusion was based on a mathematical error that even a grade school student should have been able to spot. In fact, the research data actually indicated the opposite – that liberals, not conservatives, were disposed to these behaviors.

It was three full years after their mathematical error was brought to the researchers' attention until they acknowledged their mistake and retracted their findings.

In the meantime, several peer-reviewed journals featured their work and dozens of other articles cited it. Corrections received no where near the same coverage.

This episode does point to both individual and media bias, which may well hurt the scientific community's credibility.

The new AICA law requires NSF to contract with the National Research Council to better understand the root cause of failed research reproducibility and replicability and to present recommendations to address the problems associated with it. The National Research Council will begin that work this year.

I look forward to hearing the witnesses' thoughts on these and other issues as we move toward reauthorizing the National Science Foundation.

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