

**U.S Senate Homeland Security and
Governmental Affairs Committee
Subcommittee on Federal Spending Oversight**

Broken Beakers: Federal Support for Research

Expert Testimony by

Rebecca Cunningham, M.D.

Associate Vice President for Research - Health Sciences,

Office of Research

Professor, Emergency Medicine

Professor, Health Behavior and Health Education

Director, U-M Injury Center

University of Michigan

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Good afternoon Chairman Paul, Ranking Member Peters, and members of the Subcommittee. Thank you for inviting me to speak with you today about the value of federally funded research. I also want to give special thanks to Ranking Member Peters for his work on crafting and securing passage of the American Innovation and Competitiveness Act which serves to support the critical federal research enterprise that I am here to talk with you about today.

Our great nation is what it is today because of federal investments in research. We are leaders in innovation because of these investments, our economy is strong because of these investments, and our top research institutions are the envy of the world because of these investments.

This investment has supported—and must continue to support—basic, curiosity-driven research alongside applied research and engineering. The knowledge that we derive from fundamental research is the seed to innovations like self-driving

cars and life-saving drugs. Another example is the iPad; without federal investments to deepen our understanding of basic scientific principles from agencies like DARPA, Department of Energy, NASA, NSF, and DoD, engineers would never have been able to design the core software and components that made the iPad such a ground-breaking device. This is just one example of the unknown possibilities that come out of fundamental research: innovations that our imaginations cannot always comprehend.

I have seen the benefits of these innovations first hand. As an Emergency Physician, I have seen the success of drugs and new medical technologies that allow patients to walk out of the hospital today when they would have died when I was a medical student. I have also sat with the spouses, parents and children of those who fell victim to the epidemic of opioid overdose in our nation. Over the past 20 years, funded by NIH and CDC, I have worked to develop interventions for the treatment of children impacted by substance abuse or trauma who flood through our Emergency

Rooms and have prevented many more from needing our care. I have worked with scientists and community leaders in Flint, Michigan to improve health outcomes in the wake of their water crisis, and continue to partner with our law enforcement and health department partners to translate the underlying science of opioids into policy solutions that address the opioid epidemic that is impacting every community across the nation. This reliance on fundamental research—from synthetic chemistry funded by NSF to basic neuroscience funded by NIH—helps develop policies based on sound science and life-saving medical breakthroughs that will ultimately lead to solutions that we cannot yet imagine for the opioid crisis.

Federal support for research has been part of our country's fabric dating back to the start of the republic in the 1700's. In the past 70 years alone, the role of federal funding in "game-changing" innovations has been tremendous. For example, the development of GPS, supercomputing, the visible LED, and the technology

behind the MRI machine that aids many of my patients in diagnosis of brain disease daily, all have their roots in federal investments to public sector researchers.

Federal investments in research also help drive our economy and train our future STEM workforce. Federally funded research supports local economies all across the nation by providing billions of dollars each year to vendors—from small businesses to biotech companies – who are making devices, software, and other equipment needed to perform research. Over the last 15 years, vendor spending at U-M alone has created 221,000 manufacturing jobs and 641,000 healthcare jobs. This investment also supports thousands of employees working in laboratories and research institutions across the country—of whom the largest recipients by far are students. It is this next generation that will drive and support American innovation and competitiveness in the future.

Flat funding rates in federal investments in research—and in many cases declining funding rates—over the last decade have already shown impacts on the scientific talent pipeline, driving away the next generation of leaders and innovators from careers in research. This is happening while other countries see the clear return on investment in government-sponsored research and are doubling down on their efforts to become global leaders. Indeed, several metrics related to innovation and scientific impact already show that the U.S. is losing ground to countries like China.

This trend will only continue at our current levels of investment, and the consequences will impact the American economy and our national security. For the U.S. to remain a global leader, we need to lead in innovation, science, and research. American industry leaders recognize that the federal government's investment in basic science is critical in driving innovation, productivity, and economic growth. For example, hundreds of business leaders signed the “Innovation Imperative” statement, which was a call to

action for steady federal funding increases in basic scientific research.

At the same time, the research community is constantly examining ways to improve efficiency and maximize these federal investments. However, federal regulations related to research continue to increase and add new complexity for researchers. While the U.S. research enterprise is by far considered the gold standard, there are always ways to improve the grant-making process and related reporting requirements. Examples might include streamlining proposal requirements and developing a common federal portal for grants submission, progress and financial reporting, as well as the adoption of common research terms and conditions, across research funding agencies like NIH, NSF, and DoD. Finally, in part due to leadership from researchers like Dr. Nosek, the scientific community is committed to improving the reproducibility of its work, in many cases learning

from—and collaborating with—partners in government and industry.

Thank you again for this opportunity to discuss the importance of federal investments in research. I would be happy to answer any questions.