



## **Testimony of Hunter R. Rawlings III**

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Chairwoman Murray, Ranking Member Sessions, and members of the committee, thank you for the opportunity to testify today about the impact of budget sequestration on federal investments in research and higher education. I am Hunter Rawlings, president of the [Association of American Universities](#), which represents 60 of the nation's leading public and private research universities. We believe the sequester is a terrible policy in the short and long term. My testimony will focus on two critical areas of federal spending that generate enormous returns on investment – university research and student financial aid, both of which will suffer significantly under sequestration with consequences not only for scientists, engineers, and students, but also for our nation's innovation enterprise and economy.

One of the greatest challenges facing the nation is the need to address federal budget deficits and our long-term debt. Unfortunately, deficit reduction efforts to date have focused primarily on the part of the federal budget where America's future lies – discretionary spending. Discretionary spending, which constitutes only one-third of the federal budget, has had to carry the vast majority of the deficit reduction load and will carry even more under sequestration. In particular, nondefense discretionary spending, which is only 17 percent of the budget, includes vital investments in education and innovation, as well as infrastructure needs. As a result of the tough discretionary spending caps established by the Budget Control Act, non-defense discretionary spending, even in the absence of sequestration, will decline within 10 years to its lowest level relative to GDP since 1962.

Federal support for research and student financial aid laid the foundation for the dramatic expansion of the 20th century U.S. economy and can do the same in the 21st century. These investments produce the educated people and the ideas that lead to new products, new businesses, and entire new industries, as well as to the jobs that go with them. Cutting these investments in our future is not the way to solve our nation's deficit problem. Such cuts would undermine economic growth that is essential to deficit reduction. Yet that is exactly what the sequester will do. To put it kindly, this is an irrational approach to deficit reduction. To put it not so kindly, it is just plain stupid.

Members of both political parties believe that a long-term deficit reduction agreement should specifically incorporate such investments. For example, the [majority report](#) of the bipartisan Bowles-Simpson Commission stated, "we must invest in education, infrastructure, and high-value research and development to help our economy grow, keep us globally competitive, and

make it easier for businesses to create jobs.” And the new Bowles-Simpson deficit-reduction [plan](#) also calls for “preserving high-value investments.”

Faculty members and the next generation of researchers at our universities are already feeling the effects of the potential sequester. Well before the March 1 deadline, federal science agencies began withholding funding and postponing research awards because they did not know how much funding they would ultimately have for grants. Michael Purugganan, the Dean of Science at New York University (NYU), wrote in an [op-ed](#) last month that just the mere threat of sequestration is taking its toll. He and his research collaborators are working on a new way to map genes in plant genomes which could help pave the way for new crop varieties able to withstand environmental stress. But they have delayed their work for months while waiting for a resolution to this budget mess. Purugganan is not alone in feeling the effects. AAU universities inform us that the threat of sequester is affecting hiring decisions for research scientists and postdoctoral researchers (those who have received doctoral degrees and hold temporary jobs in hope of attaining permanent positions). It is also causing great uncertainty for graduate students who do not know if they will continue to be supported by research grants.

The sequester will also hurt students from low-income families through cuts in student financial aid. If Congress allows the mandated cuts to go forward, students who receive federal aid could lose up to \$876 a year according to the [Student Aid Alliance](#). The sequester will cut work-study and other financial aid programs and increase student loan borrowing costs at the very time we are seeking to ensure greater access and improve college completion so as to have the educated citizenry and highly skilled workforce we need to grow our economy. Why would we penalize young Americans working their way through college? Why would we reduce access to higher education when other nations are improving access? What kind of message does that send to current and future college students and their families? It is not a message of opportunity.

The impact of these cuts is even more significant in the long term for research, the economy, and the nation that we will leave to our children, grandchildren, and great-grandchildren.

The sequester will cut university innovation that is critical to health, quality of life, and economic and national security of future generations, just as past research has provided these benefits to us. Research in all of the disciplines is how we, as a nation, come up with medical advances that save lives and ultimately reduce the cost of health care, advance our economy, figure out cleaner forms of energy, and develop the technologies that defend our country and make our fighting men and women safer. We have also leveraged these research investments to educate and train the next generation of scientists and engineers, who are most often supported by research grants.

To get an idea of the sequester’s likely impact on these activities, I would encourage you to visit [www.ScienceWorksForUS.org](http://www.ScienceWorksForUS.org), a [website](#) established by AAU, the Association of Public and Land-grant Universities, and The Science Coalition to show the impact of the sequester on university research. There you will find useful state-by-state data and a series of brief videos of university presidents, administrators, faculty members, and postdoctoral researchers describing their work and how it could be affected.

The federal government invests approximately \$29 billion each year in research at the nation's colleges and universities, most of this in basic research. While the private sector invests in R&D, its investment is primarily in development of products; businesses cannot afford to make investments in the riskier, long-term basic scientific research that produces the breakthrough discoveries essential to innovation. As the Congressional Joint Economic Committee has [stated](#), "Despite its value to society as a whole, basic research is underfunded by private firms precisely because it is performed with no specific commercial applications in mind." That is why there has long been a bipartisan consensus that funding basic research is primarily the responsibility of the federal government.

As Senator Lamar Alexander and I wrote in a joint [op-ed](#) last year, scientific research is a high-yield investment. More than half of economic growth since World War II has resulted from technological advances, almost none of which would have been possible without federally funded innovations. For example, federally funded research at the university level gave us the technology behind companies like Google, Cisco, and Genentech and has resulted in entire new industrial sectors that few would even have imagined, such as those in information and biotechnology.

A recent [study](#) by [United for Medical Research](#) demonstrates the extraordinary return on investment by scientific research, showing that government funding through the National Institutes of Health (NIH) in 2012 alone supported nearly half a million jobs and \$58 billion in economic activity nationwide. The long-term impact is far greater. One single project supported by NIH – the Human Genome Project – has spurred more than \$796 billion in economic growth. This is a 141-fold return on investment, in addition to the extraordinary advances in human health which it has only begun to make possible.

Two weeks ago at a press conference on the issue of the sequester, I provided a concrete example of the fruits of federal investments in scientific research that I think is worth my repeating here to illustrate what is at stake.

All of us have an iPhone, Android phone, or some other smartphone in our pockets nearly all of the time. That phone would not exist were it not for federally funded research. Here are just a few examples of why:

- The global positioning system (GPS) that enables your device to guide you to your destination would not exist without the federally funded research that produced the atomic clock.
- The amazing touch screen came directly from research funded by the National Science Foundation (NSF).
- The liquid crystal display, or LCD, monitor used on these phones comes from research funded by NIH, NSF, and the Defense Department.
- The rechargeable lithium-ion batteries that run these phones came out of basic research funded by the Department of Energy.

- The integrated circuit, which you find in practically all electronic equipment, also benefited from federally funded research, as well as great skill by industry.
- And finally the Internet and World Wide Web, which we spend so much time on with these devices, are results of federally funded research and private sector innovation.

I commend to you a video of a [briefing](#) provided by the [Task Force on American Innovation](#) entitled “Deconstructing the iPad,” in which scientists describe the history of some of these amazing technologies.

These great products that we take for granted each day cannot keep coming if the nation fails to adequately invest in scientific research. More than half a century ago, our nation’s leaders made a wise decision to fund university research and graduate education. And when the launch of Sputnik posed a challenge to our technological leadership from abroad, it spurred us to extraordinary investments in these areas.

Today we face a similar challenge to our leadership from overseas. Let me assure you that if the U.S. government falls short in its investments in education and research, other nations will be there to take our leadership position. At the very time we as a nation are squabbling about how much further to cut investments in research and education, Singapore, China, and South Korea are increasing their spending in these areas. Why are they doing this? Because they are smart. They are imitating the model we created decades ago that has led to unrivaled wealth creation, economic prosperity, and quality of life.

We should all be clear: our competitors are watching closely to see how we respond to their challenge, and are fully prepared to take advantage of our mistakes. For example, over the last 10 years, R&D expenditures as a share of economic output have remained nearly constant in the U.S. but have increased by nearly 50 percent in South Korea and nearly 90 percent in China. (Source: NSF S&E Indicators 2012) Also, according to Organisation for Economic Co-operation and Development (OECD) figures, government R&D spending between 2000 and 2009 increased by 250 percent in South Korea and 330 percent in China, while U.S. government R&D spending increased by about 45 percent. I commend to you a recent report by the Task Force on American Innovation entitled: [American Exceptionalism, American Decline?](#) This report illustrates that despite a strong history of being the world leader in research and discovery, the United States has failed to sufficiently heed indications that our advantage is diminishing and that we may soon be overtaken by other nations in these areas, which are critical to economic growth and job creation.

Now, let me share with you four examples of what will happen if sequestration is fully implemented in FY13 and beyond.

First, a recent [analysis](#) by the Information Technology & Innovation Foundation finds that sequestration will shrink federal R&D by nearly nine percent from 2011 spending levels over nine years, reducing the gross domestic product by anywhere from \$203 billion to \$860 billion over that period. As the report states, this is equivalent to “taking away all the new motor vehicles purchased by U.S. consumers over the last six months [or] all their airline travel over the last two years.”

The second example is perhaps even more sobering. The sequester would damage the nation's security efforts by cutting research funding for cyber security. NSF, the Department of Homeland Security's (DHS) Science and Technology Directorate, and the Department of Defense all would experience across-the-board cuts to cyber security research in FY13. According to a [report](#) released recently by the House Appropriations Committee minority, cyber security at DHS would be cut by 30 percent. These spending cuts could not come at a worse time. Just last week, we learned that hackers in China are engaged in prolific cyber espionage against the United States government and some of America's largest companies. America's cyber infrastructure needs to be protected, and the best way to do that is to support critical cyber security research and educate and train the next generation of cyber security experts. Yet here we are cutting this funding.

The impact of sequestration will not only reduce funding of federal research agencies, it will have a direct impact on those who conduct basic research at the nation's colleges and universities. The sequester seriously undermines opportunities for young, talented graduate students and postdoctoral researchers to train with world-renowned researchers, and to conduct cutting-edge scientific research. In a recent [Marketplace Morning Report](#), Dr. Jennifer Elisseff of Johns Hopkins University said that many in her lab are suffering from "sequester-stress." Dr. Elisseff leads a 25-person laboratory that conducts research on re-growing tissue that can later be attached to scaffolding and be placed in a human body. This is vital research that will be harmed if cuts to the NIH and Defense Department budgets come to pass. And the first to feel that impact will be the graduate students and postdoctoral researchers working in her lab.

Finally, these cuts will have a detrimental impact upon our ability to fully leverage wise investments that the nation has already made in large-scale, world-class scientific research facilities and tools located at both universities and our national laboratories. If the sequester is allowed to move forward, operations of major scientific user facilities will have to be significantly curtailed and thereby adversely affect many of the more than 25,000 researchers and students who rely on these research tools to advance basic science and to develop advance commercial technologies. Department of Energy national laboratory personnel who help to operate these facilities may be furloughed and laid off, and university and industrial access to these facilities will be reduced.

In summary, let me state this as plainly as possible: the sequester is dangerous. You should not let it happen. It undermines both immediate and long-term support for the nation's education and research enterprise. It jeopardizes our nation's economy now and for years to come. We in the university community have repeatedly urged Congress and the President to stop the sequester and address our fiscal challenges in a balanced, sensible way that preserves our nation's ability to continue to invest in areas that will lead to sustained economic growth. I do so again here today.

Thank you for this opportunity to share my views.