WRITTEN TESTIMONY OF
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FOR THE U.S SENATE COMMITTEE ON APPROPRIATIONS
HEARING
"DRIVING INNOVATION THROUGH FEDERAL INVESTMENT"
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Chairman Mikulski, Ranking Member Shelby, and members of the committee, thank you for the opportunity to present my testimony urging the committee to strengthen our nation's commitment to investing in the groundbreaking scientific endeavors taking place all across the country and to reaffirm America's place as the global leader in innovation.

I am Margaret Anderson, executive director of *FasterCures*, a center of the Milken Institute. *FasterCures* is a nonprofit and nonpartisan organization focused on improving the medical research and development system so that we can speed up the time it takes to get important new medicines from discovery to patients. We work across diseases, disciplines, and sectors – academic institutions, government agencies, biotechnology and pharmaceutical companies, investors, medical research foundations, philanthropic organizations, and patient advocacy groups – to identify and eliminate roadblocks slowing down medical progress. We strongly believe that for the medical research system to work effectively, we must have a culture that incentivizes innovation, focuses on outcomes, and facilitates collaborative solutions.

The American Innovation Playbook Works

Decades of vigorous federal investment in research and development has set the standard for innovation. Our federal investment in basic scientific research, regulatory regime, and ability to attract the best domestic and foreign scientific talent to top-flight research universities has created hundreds of billions of dollars of economic value.[i] More profound are the results that really matter: the lives we have saved and improved and the suffering we have averted. These gains are due in no small part to past and current members of this committee having the foresight and wisdom to invest in our nation and its future.

For example, look at the incredible results that have come from investing in the National Institutes of Health. The past few decades have brought enormous breakthroughs in the fundamental knowledge necessary to understand, prevent, diagnose, and treat many diseases. Americans are living nearly 30 years longer than they did in 1900.[ii] Not only have these gains in longevity enriched many lives, they have added an estimated $3.2 trillion annually to the U.S. economy since 1970.[iii] Federally funded research saves lives, and is also a huge driver of economic growth. In 2011, NIH investment supported 432,000 jobs and generated $62.13 billion in economic activity.[iv] Choose any medical advance announced by a pharmaceutical or biotechnology company, and chances are the basic science on which it was built emerged from an NIH-funded lab – 74% of pharmaceutical and biotechnology companies having licensed patents from NIH-funded academic research.[v] It is hard to imagine a place where taxpayers get a bigger bang for their buck than with investments in science and innovation. The Human Genome Project is a notable example. A $3.8 billion investment, which is what the federal government invested in the project, eventually created 310,000 jobs and $796 Billion in economic impact, a 141:1 return on investment.[vi]

The results are clear, but innovation cannot be measured just by the end results, but by the speed and efficiency of the entire process. New initiatives aimed at making the entire research and development process more effective are encouraging and must be supported further. A notable example is the work being done at the National Center for Advancing Translational Science (NCATS), which is tasked with translating promising discoveries made at the NIH into new diagnostics and therapeutics, and to reengineer the innovation pipeline in ways that will make it faster, cheaper and more productive. NCATS Director Dr. Chris Austin has described NCATS as "a collaborative instrument," that works with researchers and industry to avoid duplicative efforts and foster teamwork within the ecosystem. Collaborations like the new Accelerated Medicines Partnership (AMP) are a shining example of how the federal government can bring together non-traditional partners with a shared goal in order to develop new ways to increase the productivity of our R&D enterprise. It is important to note that a robust regulatory infrastructure, spearheaded by the Food and Drug Administration, is another crucial component in building a culture of innovation. Making sure that the products that emerge from our research and development pipeline are both safe and effective provides the confidence necessary for the results of innovation to thrive.

It's not just in health where federal investment in innovation has improved our lives and grown our economy. As Arati Prabhakar, director of the Defense Advanced Research Projects Agency (DARPA) reminded us at our Partnering for Cures meeting in New York last November; it was investments by the federal government that led the way toward the development of the Internet, space travel, and the GPS system. The last generation of federal investments eventually led to these amazing technologies that we enjoy today. What will the next generation of investment lead to? And will it be America that continues to lead the way and who will profit most from the next round of emerging technologies, or will we left on the sidelines, watching as other nations that have seen the incredible results that government investment in scientific innovation can bring, surpass us as the world's leader in these fields?

We Are Losing Our Edge

As NIH Director Dr. Francis Collins has told us, "the rest of the world has read our playbook, they know these investments work." Over the past decade, R&D expenditures as a share of GDP have remained nearly flat in the United States, while they have increased by nearly 50 percent in South Korea and nearly 90 percent in China.[vii] Directly as a result of this, China now performs almost as much of the world's high-tech manufacturing as America. The NIH provides a striking example of this disturbing sea change. For more than a decade, NIH funding has been steadily weakening. China, India, Japan, the U.K., Singapore, and other nations are catching up quickly as they increase research budgets as much as 30% a year, [viii] while the NIH budget has lost nearly 25% of its purchasing power since 2003. China alone has pledged to devote $308.5 billion to biotechnology between 2012 and 2017, compared with a projected $160 billion for all NIH programs combined.[ix]

If we don't make these investments, not only will we lose our leadership position in the global economy, we will also find young American scientists seeking more promising opportunities in other fields or in countries with a more robust medical research infrastructure. It's already happening, and will continue to happen unless we make science a national priority. Because of the erosion of resources at the NIH, the odds of a scientist being awarded a NIH grant are at their lowest levels ever.[x] We need to follow through on the implicit promises our country's leaders made to this generation of scientists, or risk losing the next generation. America's leaders told these students there is a great future in pursuing STEM education. Those who heard this call, and then persevered through as much as 15 years of professional training, now find their opportunities are shrinking. As *FasterCures* founder Michael Milken has noted, "unlike delaying construction of a bridge that can be resumed in a few years, if we lose a generation of scientists, there's no way to rebuild that human capital quickly." We must invest in the next generation of young scientists.

The tragic irony is that while federal funding of science remains flat or even shrinks, the promise of science has never been higher. For example, the new The Brain Research through Advancing Innovative Neurotechnologies (BRAIN) initiative holds the promise of revolutionizing neuroscience and unlocking the secrets of the human brain. Success in this endeavor will lead to major advances towards treating Alzheimer's disease, autism, traumatic brain injury and many other conditions. It will also unleash economic opportunities similar to those catalyzed by the Human Genome Project. New initiatives in big data analytics, fostered by this new era of digital interconnectedness, will lead to new discoveries and new applications in numerous aspects of our lives.

In Summary

The decisions we make today will have implications long into the future. Now is the time to lean in and ensure everyone understands how important it is that the federal government increases its commitment to research and development. We must make these investments in order to keep and enhance our global competitiveness, to make sure that young scientists who

have the intelligence and drive to enter the field have the resources they need, and so we can continue to invest in improving the innovation process and allow exciting new initiatives to see the light of day.

The stakes are too high not to. In the U.S., every 68 seconds, someone develops Alzheimer's disease. Every 24 seconds, someone is diagnosed with cancer. Every 18 seconds, someone is diagnosed with diabetes. Patients' lives are literally on the line. America has shown time and time again that when we invest in each other, we can overcome these big challenges, but the time for complacency is over. Time equals lives, so goes our mantra at *FasterCures,* and we cannot afford to wait any longer.

We understand the nation's long-term fiscal challenges and recognize that overall spending must be sustainable. Precisely because of these pressures, not in spite of them, we should invest in scientific innovation and make it a national priority.

Thank you again, distinguished committee members, for your service to our nation. I appreciate the opportunity to present this written testimony. I would be happy to answer any questions you have or provide additional information.

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[iii] Impact of NIH Research. National Institutes of Health. http://www.nih.gov/about/impact/index.htm

[iv] United for Medical Research: *NIH's Role in Sustaining the U.S. Economy. 2012.* http://www.unitedformedicalresearch.com/wp-content/uploads/2012/07/NIHs-Role-in-Sustaining-the-US-Economy-2011.pdf.

[v] Burnham Institute for Medical Research Congressional Briefing: *Economic Impact of NIH Funded Research.* February 25, 2009.

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[vii] National Science Board. Science and Engineering Indicators. 2014 http://www.nsf.gov/statistics/seind14/content/overview/overview.pdf

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[x] NIH Data Book http://report.nih.gov/nihdatabook/index.aspx