Research!America's Testimony submitted for the record on April 24, 2014 for the U.S. Senate Committee on Appropriations FY15 Hearing: Driving Innovation through Federal Investments.

Thank you, Chairwoman Mikulski and Vice-Chairman Shelby, for your courageous leadership and unstinting commitment to fostering American innovation. Research!America, a public education and advocacy alliance committed to advancing medical and other scientific research and development, appreciates the Committee's stewardship over our nation's discretionary funding priorities and is grateful for this opportunity to provide this testimony.

We understand that the Committee is not simply exploring the ways in which federal investments drive innovation, but examining the significance of that innovation to America and Americans, and whether the return on our investment justifies current, higher, or lower levels of spending. In the context of health and medical research, the facts are as convincing as the most reasoned arguments. The examples below, while far from exhaustive, demonstrate that investing in research fosters innovation that saves lives, saves federal dollars, protects our nation, meets national defense objectives, helps sustain our global leadership, and fosters our economy locally and on a national scale. Increased federal funding for such research is more than a sound investment; it is a national imperative.

Advancing Disease Prevention, Diagnosis, and Treatment

The medical advances arising from noncommercial federal investment, coupled with private sector capital, are so manifest that their very existence -- much less their enormous contribution to the longevity, productivity, and overall well-being of Americans -- is taken for granted. The following examples offer a glimpse into the incredible impact of noncommercial federal investment in this arena:

- Corticosteroid inhalers reduce the frequency and severity of asthma attacks, easing the suffering associated with this disabling condition and saving lives. National Institutes of Health (NIH)-funded research on the cause of anaphylaxis helped scientists understand how allergic reactions produce an inflammatory response. And NIH-funded scientists identified inflammation in the lungs as an underlying cause of asthma. Once scientists and practitioners established that anti-inflammatory corticosteroids eased symptoms in asthma patients, pharmaceutical companies formulated the fast-acting corticosteroid inhalers used today.
- Treatments based on a naturally produced anti-coagulant dissolve clots in heart attack and stroke patients with fewer side effects. While Belgian scientists were conducting research on how cancer cells spread through tissue, they discovered t-PA, a naturally occurring clot-dissolving enzyme. NIH-funded researchers, Belgian researchers, and scientists at Genentech collaborated to mass-produce t-PA. When provided to heart attack and stroke patients soon after the onset of symptoms, t-PA restores blood flow with low risk of excess bleeding, decreasing mortality and long-term disability by over 30 percent.
- The Brain Research through Advancing Innovative Neurotechnologies (BRAIN) initiative is a collaborative effort to develop breakthrough technologies related to conditions and disorders of the brain. As a partner in this initiative, the National Science Foundation (NSF) has made a $20 million contribution towards groundbreaking research across the fields of biological, physical, social, and behavioral sciences. This innovative

project is designed to help overcome the vast complexities hindering progress in the neurotechnology so that desperately needed solutions can be found for brain diseases and disorders.

Speeding Access to Safe and Effective Medical Advances

Among its many contributions to human health and safety, the Food and Drug Administration (FDA) bears the formidable responsibility of ensuring that safe and effective medical treatments reach patients as soon as possible. Because lives hang in the balance, FDA, academia, patients, and industry are working together to maximize the speed and accuracy of drug development and the regulatory review that follows.

- FDA investment produced computer modeling that helps medical device designers predict the performance of cardiovascular devices
- The Center of Excellence in Regulatory Science at the University of Maryland, established with a grant from the FDA, is supporting research to enable the drug industry to more quickly identify liver toxicity as drugs are being developed and tested, saving precious resources and time in the search for safe and effective new treatments.

Improving Healthcare Delivery

Medical innovation doesn't stop when a new medical product becomes available: to optimize the value of those products, health services, and other social sciences, researchers are continuously improving the systems and methods by which healthcare is delivered.

- Findings from the Agency for Healthcare Research and Quality (AHRQ)-funded research resulted in the implementation of Comprehensive Unit-based Safety Programs across the country, saving thousands of lives and hundreds of millions of dollars by preventing hospital-acquired infections.
- With support from the Patient Centered Outcomes Research Institute (PCORI), researchers are measuring the impact on patient outcomes of an increased focus on the day-to-day struggles faced by patients with chronic conditions. The goals are to improve patient-clinician communication, shared decision making, and outcomes that matter most to patients.

Bolstering our Nation's Public Health System

One key measure of how well a government serves its citizens is the competency, flexibility, and rapid response capability of its public health authority.

- The Centers of Disease Control and Prevention (CDC) must constantly innovate to meet the diversity of health threats it is responsible for addressing. Recent examples include new information technology to combat Group B Strep (GBS), one of deadliest threats to newborns; and research-based protocols to dramatically reduce the time needed to contain deadly Listeria outbreaks.
- The CDC, along with NIH, the Department of Defense (DOD), the Biomedical Advanced Research and Development Authority (BARDA), the Department of Homeland Security (DHS), and the FDA are fast at work producing new preventative tools and countermeasures to protect Americans from anthrax poisoning and other bioterrorism threats.

Reducing Health Spending
Skyrocketing health spending is a primary driver of the federal deficit. Such spending cannot be meaningfully reduced without federal investment in medical innovations.

- Researchers estimate that introducing a treatment in 2015 that could delay the onset of Alzheimer's by only 5 years would reduce the total annual healthcare cost to all payers by almost $500 billion by 2050.
- The CDC adopted new research-based guidelines for emergency Traumatic Brain Injuries that are expected to save almost $300 million annually in medication and rehabilitation costs and at least $3.8 billion annually in indirect healthcare costs.

Protecting our Troops and Empowering Wounded Warriors
Innovation plays no role more important than protecting and meeting our obligations to our armed forces.

- To protect troops from infectious agents, the DOD Military Infectious Diseases Research Program (MIDRP) has played a significant role in the development of 25 percent of the vaccines licensed in the United States since 1962.
- Individuals with paralysis regained movement when a stimulator was implanted into their lower spines in an NIH-funded research study. Further research and development in this area could dramatically improve the lives of countless veterans and wounded warriors.

Fostering Economic Development, Jobs, and Global Competitiveness
Federal investment in health and medical research supports jobs and helps fuel the American economy.

- NIH investment returns an estimated $2.21 to the economy for every $1 invested.
- NIH-funded research supported over 400,000 jobs across the United States in 2012.
- The public-private medical research pipeline is a major contributor to U.S. export success.
- The global output of the U.S. pharmaceutical industry decreased by 10% from 2000 to 2010 alone.
- China's pharmaceutical output has increased almost 16% from 1995 to 2010.

It is true that federal investment drives innovation. It is also true that without federal investment, our nation cannot sustain its position as the world's most prolific innovator. The public sector and private sector each do what they must do to fuel innovation in our robustly free-market society. The government, along with as much help as possible from the non-profit and philanthropic sectors, funds noncommercial innovation, and the private sectors funds commercial innovation. If the government continues to starve noncommercial innovation, Americans can expect sustained economic decline, dramatically slowed medical progress, and a reversal in the direction of their quality of life. There is no silver lining. Thank you for your consideration.