Testimony of
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On
FY 2011 Appropriations for the National Science Foundation

Before the
House Committee on Appropriations
Subcommittee on Commerce, Justice, Science, and Related Agencies
Congressman Alan B. Mollohan, Chair
Congressman Frank R. Wolf, Ranking Member

February 11, 2010

Mr. Chairman, Mr. Wolf and members of the Subcommittee, thank you for the opportunity to testify today, and for your ongoing commitment to innovation in science. My name is Bill Talman, and I am the President-Elect of the Federation of American Societies for Experimental Biology. My organization represents 23 biomedical research societies with a combined membership of well over 90,000 individual scientists and engineers – we are the largest life science organization in the United States. Today, I am here on their behalf to request an FY 2011 budget for the National Science Foundation (NSF) of $7.68 billion.

As you know, NSF is the only federal agency supporting research and education in all disciplines of science, engineering, and mathematics and is the principle source of federal support for research in many fields. No other agency has the ability to support interdisciplinary collaborations as effectively, and these collaborations have enabled many important advances in science.

I am a biomedical scientist and a neurologist practicing medicine at a VA hospital, but I come before you not on behalf of biology alone, but in full support of adequate funding for all fields of science. The world we live in is vastly improved by the research of scientists, engineers, and mathematicians studying a broad range of topics. It is also abundantly clear to me that the work we do in medicine and life sciences has been tremendously enriched by discoveries in physics, mathematics, chemistry and engineering. To provide just one example, the rapid development of imaging techniques including Magnetic Resonance Imaging (MRI), Positron Emission Tomography (PET), and Computerizes Tomography (CT) has revolutionized my specialty (as well as many others), saving lives, improving care, and reducing costs by preventing unnecessary surgery and guiding those that are performed, expediting therapeutic intervention, eliminating the need for dangerous testing, and avoiding unwarranted admission to hospital.

This year, Congress provided a generous and much needed investment in fundamental science when it included NSF in the *American Recovery and Reinvestment Act* (ARRA). This legislation enabled federal science agencies to start ground-breaking research projects, upgrade facilities and equipment at research institutions across the country, and expand the scope of important ongoing work. The majority of the ARRA allocation for NSF was spent on research, primarily

on high-quality proposals for which funding was not previously available. These awards supported research in areas such as nanotechnology, climate change, development of new drug delivery systems, and other interdisciplinary studies that will transform our understanding of the world around us and generate new technologies. As we know from past experience, these projects will provide jobs and foster commercial activity throughout the broader economy.

Timely, valuable, and in great demand, ARRA funds are doing much to advance knowledge in all fields of science. However, unless preparations are made to *continue* this support, newly funded research projects will be halted and jobs will be terminated. To truly fulfill the promise of our investment, we must renew our commitment to sustained, predictable growth in research funding. This is an essential element in restoring and maintaining both national and local economic growth and vitality, as well as retaining this nation's prominence as the world leader in science and technology.

The competition to receive an NSF research grant is fierce – and with good reason. NSF has a history of identifying scientific talent early and funding some of the most promising research. A total of 187 U.S. and U.S.-based researchers – 56 in physics, 48 in chemistry, 41 in economics, and 42 in medicine – have been funded by NSF early in their careers before going on to win a Nobel Prize. NSF plays a significant role in advancing medical research – in fact, one of these Nobel Prizes was awarded for work that led to the development of magnetic resonance imaging (MRI), which is now a key diagnostic tool in hospitals around the world.

Some of the current work is equally as amazing. For example, in conjunction with the Department of Energy and the National Eye Institute, NSF helped to fund a team of ophthalmologists, engineers, neuroscientists and other experts to create the first ever artificial retina. This device has been shown to restore some level of sight to those who have lost vision due to retinal disease. By 2011, the research team expects to start clinical testing on a version that will allow for reading and face recognition. Another example of NSF-funded projects with medical application is research on the origin, structure and function of naturally occurring nanocapsules. Ongoing work to understand these molecules is providing scientists with the information needed to engineer them for medically relevant tasks. Some day, these tiny capsules may be used to deliver chemotherapy directly to cancer cells, correct genetic mutations, or extract toxins on a cellular level.

NSF is also committed to achieving excellence in science, technology, engineering, and math education at all levels. NSF supports a wide variety of initiatives aimed at preparing science teachers, developing innovative curricula, and engaging students in the process of scientific discovery. One of many NSF programs to prepare future scientists, the Integrated Graduate Education Research and Training (IGERT) program, supports 125 doctoral degree programs that foster collaborative and interdisciplinary training in emerging scientific domains. IGERT trainees have produced several important scientific and technological breakthroughs, including more efficient fuel cells, one of the first steps toward sustainable and renewable energy generation, as well as novel media systems and rehabilitation methods to speed the recovery of patients who have experienced a stroke. In this way, NSF helps to ensure that its tradition of creative thinking in science, engineering, and mathematics continues in the next generation of researchers.

Since it was established in 1950, NSF has fueled innovation, energized the economy, and improved health and quality of life for all Americans. NSF's strategic plan will ensure that the U.S. remains a world leader in science and engineering, even as these fields continue to evolve. In the years ahead, funding for NSF will allow the agency to accelerate discovery, promote transformational, interdisciplinary research projects, and foster innovative approaches to science education and training at all levels.

Thank you for the opportunity to offer FASEB's support for NSF. I would be happy to answer any questions the committee has at this time.