

Appropriations Subcommittee Statement on the Fiscal Year 2015 Budget

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July 17, 2014

Mr. Chairman and Members of the Committee:

I am pleased to present the President's budget for the National Institute of General Medical Sciences (NIGMS) of the National Institutes of Health (NIH). The FY 2015 budget of \$2,368,877,000 includes an increase of \$6,983,000 above the comparable FY 2014 level of \$2,361,894,000. NIGMS considers its public funds a precious resource and focuses on efficiency and effectiveness in making investments in research and training. The Institute spends 97 percent of its budget outside of the NIH, funding biomedical research and training at universities and other institutions across the country—where creative minds are at work every day producing new knowledge about health and disease.

Scientific discovery is the engine for advances in medicine, as research results lead to new treatments and refine current standards of care. Biomedical research relies on attracting and retaining a creative and well-trained workforce. NIGMS remains committed to enabling researchers throughout the United States to answer important scientific questions in fields such as cell biology, biophysics, genetics, developmental biology, pharmacology, physiology, biological chemistry, biomedical technology, bioinformatics, computational biology, selected aspects of the behavioral sciences and specific cross-cutting clinical areas that affect multiple organ systems. To assure the vitality and continued productivity of the research enterprise, NIGMS also provides leadership in training the next generation of scientists as well as in developing and increasing the diversity of the scientific workforce.

Back to Basics

The high value of investigator-initiated research has stood the test of time. This approach, in which scientists decide what questions are important to study, ultimately leads to major advances in medicine and technology. Examples include:

- Studies of virus-resistant bacteria led to the discovery of restriction enzymes, which act like highly specific scissors for cutting DNA. This discovery launched the multi-billion-dollar biotechnology industry, starting with the laboratory-based production of life-saving medicines like insulin and now extending even beyond biomedicine into agriculture and biofuels.
- Seemingly esoteric studies of how electric fields affect DNA replication in bacteria lead directly to the discovery of the anti-cancer drug cisplatin, which has saved thousands of human lives.

- Studies of enzymes that copy DNA and RNA and that cut proteins enabled the development of drugs to treat HIV infection.

To ensure a continued pipeline of fundamental scientific advances that will lead to future medical and technological breakthroughs, NIGMS is rebalancing its portfolio to renew and reinvigorate its support for question-driven, investigator-initiated research. This rebalancing has received strong support from stakeholder organizations, including the Federation of American Societies for Experimental Biology, an umbrella group representing 26 scientific societies and over 115,000 researchers.

Planning Carefully for the Future

NIGMS has begun a new strategic planning process that is focusing on enhancing the efficacy, efficiency and adaptability of the Institute's internal processes and the mechanisms through which we support biomedical research. In particular, we are exploring the development of new grant mechanisms that would increase stability and flexibility for researchers and maximize the scientific return on taxpayers' investment. These mechanisms will focus on the efficient use of funds, encouraging scientists to undertake ambitious and creative projects that may be the breakthroughs of tomorrow.

NIGMS is also developing new strategies to strengthen and maintain the pipeline of talented, creative, diverse and highly skilled young investigators. This segment of the biomedical workforce is essential for the future of scientific research in the United States, which is in turn essential for the future health and economic competitiveness of our nation. Specific strategies we are considering to address the challenges facing young investigators include outcomes-based enhancements of our training programs and efforts to improve the competitiveness of young investigators in obtaining and keeping research grants.

Supporting a Diversity of Ideas

NIGMS is proud to be the home of the IDeA program, which ensures that cutting-edge research is conducted in every region of the country. This strategy is critical to the strength of our biomedical research enterprise, as it meets the need to involve the most diverse set of minds, experiences and approaches for solving difficult health-related problems. Last year, NIGMS funded or co-funded 58 competing grants to IDeA researchers, this included 25 competing Centers of Biomedical Research Excellence awards. Particularly exciting research developments funded by the IDeA program include the demonstration by Kentucky researchers that electrical stimulation of the spinal cord can restore some motor function in individuals with paraplegia; a study by scientists in South Carolina showing that nanoparticles coated with antioxidant proteins can protect against stroke-related damage;

and a neonatal telemedicine center in Arkansas that has contributed to a significant decrease in statewide infant mortality.

As requested by both the House and Senate and required by the Consolidated Appropriations Act of 2014, NIH has submitted a response to the National Academies' Report on EPSCoR and related programs. As part of the NIGMS strategic planning process, we are developing plans for enhancing access to resources for moving discoveries and innovative ideas from laboratories in IDeA states into commercial products. In particular, we are exploring support for regional biotechnology incubators that would give faculty in IDeA states access to laboratory space, equipment, expertise and advice required to make their work competitive for SBIR/STTR and venture capital funding.

Advancing Health Through Discovery

This past year, NIGMS-funded scientists broke new ground in a range of areas relevant to health, including chemistry, microbe-host interactions, computer modeling and metabolism. Selected examples include:

- A Tennessee researcher developed a chemical method to shave the cost of manufacturing expensive drugs, including those used to treat HIV/AIDS. The method is also environmentally friendly in that it employs natural molecules called enzymes instead of synthetic chemicals that are often hazardous.
- A scientist from Vermont created the first-ever interaction map of human proteins that attach to proteins from arenavirus and hantavirus, providing potential new targets for therapies to treat the often deadly illnesses caused by these classes of viruses.
- A Pennsylvania researcher found compounds that block a recently discovered pathway for preventing production of damaged proteins. These chemicals have antibiotic activity, suggesting they might eventually be developed into a new class of antibacterial drugs.
- A scientist from California learned from mouse studies that a high-fat diet influences the internal body clock controlling liver metabolism. The team also discovered that the effect was reversible by returning to a balanced, low-fat diet. These discoveries are a small subset of the productivity of the nearly 4,000 scientists NIGMS supports throughout the United States. Our public investment to fuel their curiosity-driven exploration of biomedicine is growing knowledge, and local economies, as well as improving the health of all Americans.

Thank you, Mr. Chairman. I would be pleased to answer any questions that the Committee may have.