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**FY 2017 SENATE APPROPRIATIONS COMMITTEE PUBLIC TESTIMONY
SUBMITTED BY THE ENDOCRINE SOCIETY
FOR THE SUBCOMMITTEE ON LABOR, HEALTH AND HUMAN SERVICES,
EDUCATION, AND RELATED AGENCIES
ADDRESSING THE NATIONAL INSTITUTES OF HEALTH
May 19, 2016**

The Endocrine Society thanks the Subcommittee for the opportunity to submit the following testimony regarding Fiscal Year (FY) 2017 federal appropriations for biomedical research.

The Endocrine Society is the world's largest and most active professional organization of endocrinologists representing more than 18,000 members worldwide. Our organization is dedicated to promoting excellence in research, education, and clinical practice in the field of endocrinology. The Society's membership includes basic and clinical scientists who receive federal support from the NIH to fund endocrine-related research focusing on, among other challenges, diabetes, cancer, fertility, aging, obesity and bone disease. Our membership also includes clinicians who depend on new scientific advances to better treat and cure their patients' diseases.

100 Years of Endocrine Research: An Investment in the Nation's Health

Sustained investment by the United States federal government in biomedical research has dramatically advanced the health and improved the lives of the American people. The United States' NIH-supported scientists represent the vanguard of researchers making fundamental biological discoveries and developing applied therapies that advance our understanding of, and ability to treat human disease. Their research has led to new medical treatments, saved innumerable lives, reduced human suffering, and launched entire new industries.

Endocrine scientists are a vital component of our nation's biomedical research enterprise and integral to the healthcare infrastructure in the United States. Endocrine Society members study how hormones contribute to the overall function of the body, and how the glands and organs of the endocrine system work together to keep us healthy. Consequently, endocrinologists have a unique approach to and understanding of how the various systems of the human body communicate and interact to maintain health. The areas governed by the endocrine system are broad and essential to overall wellbeing; endocrine functions include reproduction, the body's response to stress and injury, sexual development, energy balance and metabolism, bone and muscle strength, and others. Endocrinologists study glands such as the adrenal glands, pancreas, thyroid, and specific sections of the brain, such as the hypothalamus, that control these glands. Endocrinologists also study interrelated systems, for example how hormones produced by fat can influence the development of bone disease.

This year, the Endocrine Society is celebrating its centennial anniversary. The past 100 years have seen hundreds of millions of people helped by the lifesaving treatments and quality care developed through research on hormones funded by the federal government. Some examples include:



- Endocrine scientists discovered and figured out how the hormone insulin works, resulting in treatments for diabetes.
- Endocrine scientists identified and characterized the effects of hormones such as aldosterone on the heart, leading to new treatments for heart failure¹.
- Endocrine scientists discovered that hormones produced by the thyroid gland are necessary for normal cognitive and physical development. Subsequent isolation and characterization of thyroid hormones lead to the development of new, better, and safer therapies for patients with thyroid disorders².
- Endocrine scientists have used animal models for obesity to better understand the neuroendocrine basis of obesity, discovering new hormones that regulate energy balance and hunger, such as leptin³.
- Endocrine scientists improved our understanding of hormone-responsive cancers, such as estrogen-sensitive breast cancer. This knowledge has improved our treatment of certain cancers; tamoxifen, for example, has been used for over 30 years to treat hormone-receptor positive breast cancer by selectively blocking estrogen receptors⁴.

The Future of Endocrine Research

More research progress is within reach and could lead to exciting new treatments for serious diseases, for example:

- For patients with diabetes, new treatments could use stem cells derived from skin cells to replace pancreatic cells lost during the progression of the disease; more research has begun to enable the creation of a bionic pancreas that automatically responds to a patient's needs throughout the day.
- New classes of drugs could be developed to combat the obesity epidemic⁵.
- Combination approaches that combine chemotherapy with hormonal therapy could improve the treatment of metastatic prostate cancer⁵.
- Hormonal therapies could help women with primary ovarian insufficiency restore their bone density to normal levels⁶.

As we enter a new era of precision medicine, endocrine scientists are also learning how genetic and biologic markers can be used to understand what causes a disease, the risk factors that predispose to

¹ Richard J. Auchus "Classics in Cardiovascular Endocrinology: Aldosterone Action Beyond Electrolytes" *Endocrinology*, February 2016, 157(2):429 – 431.

² Anthony N. Hollenberg "The Endocrine Society Centennial: The Thyroid Leads the Way" *Endocrinology*, January 2016, 157(1):1–3.

³ Manuel Tena-Sempere "The Endocrine Society Centennial: Genes and Hormones in Obesity... or How Obesity Met Endocrinology" *Endocrinology*, March 2016, 157(3):979 –982.

⁴ <http://www.cancer.gov/types/breast/breast-hormone-therapy-fact-sheet#q6> Accessed April 11, 2016. ⁵ Ken K. Y. Ho "Endocrinology: the next 60 years" *Journal of Endocrinology* (2006) 190, 3–6.

⁵ Harrison Wein "Combination Therapy for Metastatic Prostate Cancer" *NIH Research Matters* August 24, 2015. <http://www.nih.gov/news-events/nih-research-matters/combination-therapy-metastatic-prostate-cancer> Accessed April 6, 2015.

⁶ <http://www.nih.gov/news-events/news-releases/hormone-treatment-restores-bone-density-young-womenmenopause-condition> Accessed April 6, 2015.



disease, and how patients will respond to a particular treatment. Translating these new discoveries and technologies into personalized patient care offers the possibility of more effective treatments, less toxicity, increased disease prevention, improved quality of life, and lower health care costs. Several endocrine-specific conditions are on the cusp of a breakthrough in diagnostic testing. The ability to test for specific genetic mutations that cause the syndrome of resistance to thyroid hormone can dramatically alter potential treatment options. Additionally, rare adrenal tumors called pheochromocytomas and paragangliomas are notoriously challenging to diagnose. Genetic tests can reduce delays in diagnosis, help determine whether a tumor is likely to be malignant, and provide doctors with critical data to help monitor family members who might also carry a problematic mutation⁷.

Flat Funding Threatens Scientific Momentum

The Endocrine Society was encouraged by the \$2 billion increase for NIH in the FY 2016 Omnibus Appropriations bill. This increase was desperately needed to allow the NIH to keep pace with inflation. However, the biomedical research community requires steady, sustainable increases in funding to ensure that the promise of scientific discovery can efficiently be translated into new cures. NIH grant success rates are predicted to remain at historically low averages, meaning that highly skilled scientists will continue to spend more time writing highly meritorious grants that will not be funded. Young scientists will also continue to be driven out of biomedical research careers due to the lack of funding.

The lack of sustained government support compounded by austerity measures such as sequestration has created an environment that is leading to a “brain drain,” as gifted scientists pursue other careers or leave the United States to develop important research breakthroughs and therapies elsewhere. In 2013, the number of NIH-supported scientists declined significantly, with nearly 1,000 NIH scientists dropping out of the workforce⁸. NIH scientists run labs that support high-quality jobs and education while generating breakthrough innovations. In 2011, the NIH directly or indirectly supported over 432,000 jobs across the country⁹.

We may never be able to quantify the opportunities we have missed to improve the health and economic status of the United States due to persistent underinvestment in research. We do know however, that when “laboratories lose financing; they lose people, ideas, innovations and patient treatments¹⁰.” Based on the personal stories of researchers who have been forced to curtail research programs, we know that research programs to understand how genetics can influence heart disease, develop therapeutic treatments for Parkinson’s disease, and evaluate the effect of metal contaminants on reproductive health, among many others, are delayed or terminated¹¹.

FY 2017 NIH Funding Request

The Endocrine Society recommends that the Subcommittee provide at least \$35 billion in funding for NIH in the FY 2017 Labor-HHS-Education Appropriations bill. This funding recommendation represents the

⁷ Eric Seaborg, “Family History.” *Endocrine News*, Feb. 2015. 15-17.

⁸ Jeremy Berg “The impact of the sequester: 1,000 fewer funded investigators.” *ASBMB Today*. March (2014). <https://www.asbmb.org/asbmbtoday/201403/PresidentsMessage/> Accessed March 20, 2014.

⁹ Everett Ehrlich “Engine Stalled: Sequestration’s Impact on NIH and the Biomedical Research Enterprise.” *United for Medical Research*. (2012).

¹⁰ Teresa K. Woodruff “Budget Woes and Research.” *The New York Times*. September 10, 2013.

¹¹ Sequester Profiles: How Vast Budget Cuts to NIH are Plaguing U.S. Research Labs. *United for Medical Research*. http://www.unitedformedicalresearch.com/advocacy_reports/sequestration-profiles/ Accessed March 20, 2014.

minimum investment necessary to avoid further loss of promising research and at the same time allows the NIH's budget to keep pace with biomedical inflation.



It is critical that we continue to invest in biomedical research to improve the Nation's future financial situation. Rising healthcare costs threaten to consume an increasing percentage of the United States' GDP and also the individual budgets of workers and businesses¹². The cost of diabetes, in particular, represents a staggering \$245 billion in 2012 alone¹³.

We live during an age of tremendous scientific opportunity that can only be realized through federal funding of biomedical research. Researchers are just beginning to harness the power of big data to solve complicated problems. Innovative new experiments and clinical research hold promise to solve some of the United States' greatest medical challenges and discover new ways to improve our quality of life. Government support is critical to these opportunities, and we encourage the Appropriations Committee to actively support promising and innovative research. We fully understand that the Appropriations Committee faces challenging decisions in FY 2017; however, we assert that additional cuts to the NIH and other non-defense discretionary programs is not the way to solve the budgetary issues facing the United States.

The Endocrine Society remains deeply concerned about the future of biomedical research in the United States without sustained support from the federal government. Flat funding levels would threaten the nation's scientific enterprise. The Society strongly supports increased federal funding for biomedical research in order to provide the additional resources needed to enable American scientists to address scientific opportunities and maintain the country's status as the preeminent research engine in the world. The Endocrine Society therefore asks that the NIH receive at least \$35 billion in FY 2017.

¹² Dan Mangan "Job health insurance costs rising faster than wages." CNBC. 9 Dec. 2014. <http://www.cnbc.com/id/102249938#>. Accessed March 19, 2015.

¹³ <http://www.diabetes.org/advocacy/news-events/cost-of-diabetes.html> Accessed March 19, 2015.