

PREPARED STATEMENT OF LINDA S. BIRNBAUM, PH.D., D.A.B.T., A.T.S.
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SCIENCES

Mr. Chairman and Members of the Committee: I am pleased to present the President's Fiscal Year (FY) 2016 Budget request for the National Institute of Environmental Health Sciences (NIEHS) of the National Institutes of Health (NIH). The FY 2016 budget request for NIEHS is \$681,782,000, which is \$14,449,000 more than the FY 2015 level.

The NIEHS Strategic Plan, *Advancing Science, Improving Health*, continues to guide efforts toward fulfilling NIEHS's mission, which is to discover how the environment affects people in order to prevent both acute and chronic illness.

ADVANCES IN ENVIRONMENTAL HEALTH RESEARCH

Obesity has more than doubled in children and quadrupled in adolescents in the past 30 years to nearly one in five. For adults, the number is even worse: more than one-third (34.9 percent or 78.6 million) of U.S. adults are obese. Obesity-related conditions include heart disease, stroke, Type 2 diabetes and metabolic syndrome, and certain types of cancer, some of the leading causes of preventable death. It is clear that obesity and its attendant co-morbidities are the outcome of a complex interaction of genetics, environmental exposures – including those that may occur in prior generations – and behaviors. NIEHS research is focused on teasing apart this interaction to identify contributing factors in the environment that may offer targets for preventing obesity, as well as understanding obesity-related effects on environmentally mediated disease.

Both animal and epidemiological studies are providing evidence that exposure to endocrine disrupting chemicals is interfering with the body's metabolism. Perinatal lead exposure is associated with increased food intake, body weight, total body fat, energy expenditure, activity, and insulin response in mice. At NIEHS and the Environmental Protection Agency (EPA) jointly funded Children's Environmental Health and Disease Prevention Research Centers, researchers are using a pooled cohort of human data on prenatal exposure to phthalates and growth through age seven, to investigate associations of maternal exposure and adiposity in children. Another project is examining the characteristics of the microbiome of a cohort followed from birth to age 28, to investigate developmental and postnatal exposure to environmental chemicals and possible associations with markers of glucose metabolism abnormalities. Researchers are also working to understand how obesity may interact with and exacerbate diseases such as colon cancer and asthma.

NIEHS's efforts in children's environmental health have yielded some exciting discoveries in recent months. In one of the first United States-wide studies of air

pollution and autism, NIEHS grantees report that women exposed to high levels of fine particulate matter during pregnancy – particularly in the third trimester – may have up to twice the risk of having a child with autism than mothers exposed to low levels of particulate matter. Another study shows an association between prenatal exposure to selective serotonin reuptake inhibitors (SSRIs), drugs used to treat depression and anxiety, and autism spectrum disorder, as well as developmental delays in boys. NIEHS-funded researchers at Columbia University found that seven-year-olds who experienced prenatal exposure to elevated levels of two phthalates had lower IQ scores than children exposed to lower levels. In an unrelated study, researchers report that prenatal exposure to polybrominated diphenyl ether (PBDE) flame retardants can lead to lower IQs and greater hyperactivity in five-year-old children.

Toxic ingredients in personal care products continue to be a concern for consumers and a focus of NIEHS research. A phase-out of the antibacterial agent triclosan, used in many personal care products, was spurred in large part by a study, conducted by researchers at the University of California at Davis Children's Environmental Health Center, which showed it weakens cardiac and skeletal muscle. A study by NIEHS and National Toxicology Program (NTP) researchers had demonstrated both estrogenic and anti-estrogenic activity in off-the-shelf hair and skin care products, suggesting further study is warranted. To facilitate such study, NTP is proposing a collaboration with EPA to assess the accuracy of questionnaires used in epidemiological studies as they relate to exposure information about personal care products.

COLLABORATIVE DISASTER RESEARCH

In July 2014, NIEHS launched the Disaster Research Response (DR2), an effort to be better prepared for performing timely disaster research well before weather, terroristic attacks, and other disruptive events strike. The program is working to develop quick access to useful data collection tools, rapid development and implementation of research protocols, a national environmental health researcher network, and capacity to deploy trained researchers to the field. As part of this effort, NIEHS, in partnership with the National Library of Medicine, the Centers for Disease Control and Prevention (CDC), the Office of the Assistant Secretary for Preparedness and Response at the U.S. Department of Health and Human Services, and others, is conducting tabletop disaster response exercises in communities around the country that bring together public health and preparedness officials, scientists, community leaders, law enforcement, and others to train for disaster events. One such event occurred in 2014 when 10,000 gallons of toxic chemicals spilled into the Elk River in West Virginia, potentially affecting the drinking water of some 300,000 people. In response to requests from CDC and West Virginia political officials, NTP quickly developed a plan for both short-term toxicity tests and studies to look for any long-term human health effects of the spill. NIEHS has also played a lead role in the development of the Sustainable and Climate Resilience Health Care Facilities Initiative, whose goal is to

assist health care providers, design professionals, policymakers, and others, in maintaining continuity of care before, during, and after extreme weather events.

CONCLUSION

NIEHS is working every day to advance its understanding of how the environment and biology interact. NIEHS is committed to scientific leadership for innovative research in the environmental health sciences that improves public health and promotes healthier lives by preventing disease and disability.

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Linda S. Birnbaum is the Director of the National Institute of Environmental Health Sciences (NIEHS) of the National Institutes of Health (NIH), and Director of the National Toxicology Program. A board certified toxicologist, Dr. Birnbaum has served as a Federal scientist for more than 35 years. Dr. Birnbaum has received many awards and recognitions, including the Women in Toxicology Elsevier Mentoring Award, the Society of Toxicology Public Communications Award, EPA's Health Science Achievement Award and Diversity Leadership Award, the National Center for Women's 2012 Health Policy Hero Award, Breast Cancer Fund Heroes Award, and 14 Science and Technology Achievement Awards, which reflect the recommendations of EPA's external Science Advisory Board, for specific publications. Dr. Birnbaum was also elected to the Institute of Medicine of the National Academies and has received honorary degrees from the University of Rochester and Ben-Gurion University in Israel.

Dr. Birnbaum is a former president of the Society of Toxicology, the largest professional organization of toxicologists in the world; a former chair of the Division of Toxicology at the American Society of Pharmacology and Therapeutics; and a former vice-president of the American Aging Association. She is the author of more than 700 peer-reviewed publications, book chapters, and reports. She is also an adjunct professor at the University of North Carolina at Chapel Hill and Duke University. A native of New Jersey, Dr. Birnbaum received her M.S. and Ph.D. in microbiology from the University of Illinois at Urbana-Champaign.