

# FY 2007 NIEHS Director's Statement

Department of Health and Human Services National Institutes of Health

## FY 2007 Budget Request

**Written Statement of  
David A. Schwartz, M.D., Director  
National Institute of Environmental Health Sciences  
2006**

Mr. Chairman and Members of the Committee:

I am pleased to present the President's budget for the National Institute of Environmental Health Sciences (NIEHS) for FY 2007, a sum of \$637,323,000 which reflects a decrease of \$3,809,000 from the FY 2006 appropriation.

## Introduction

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As the Director of NIEHS, I am grateful for this opportunity to present our vision for the Institute and environmental health sciences. Our vision at NIEHS is to prevent disease and improve human health by using environmental sciences to understand human biology and human disease. Environmental agents contribute to many conditions of public importance, including cancer, neurodevelopmental disorders, autoimmune diseases, and chronic lung disease. While many of our investigators are focused on understanding the causes of disease, we are also involved in studies of susceptibility, basic mechanisms of disease, and identifying novel approaches to intervention and disease prevention.

Recent NIEHS-supported research illustrates the range of our Institute's science. In studying asthma, NIEHS scientists examined the mechanisms controlling the body's own system for achieving balance between airway constriction and airway relaxation. They discovered a natural bronchodilator, deficient in asthmatics, that relaxes the airway; absence of this enzyme in mice increases the development of allergen-induced asthma. In other work, investigators studied the role of supplements in preventing birth defects. While folate has been shown to prevent spina bifida, a defect in the spinal column, epidemiologists have now discovered that women who take folate supplements during pregnancy are at reduced risk of giving birth to a child with cleft lip and palate birth defects. Finally, NIEHS-supported studies have shown that short-term exposure to ozone

can increase mortality rates. These studies demonstrated that a 10-part per billion (ppb) increase in the previous week's ozone was associated with a significant increase in cardiovascular and respiratory mortality.

## Current Challenges

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Today, we find ourselves at a critical junction where new tools and opportunities for substantial scientific achievement intersect with our growing understanding of cellular and molecular mechanisms by which environmental exposures exert their effects. Our challenge is to take advantage of these advances and to forge new frontiers to improve our nation's health. To help ensure that the best opportunities are identified and funded, we have made several programmatic and scientific changes at the Institute since last April. Importantly, these changes are consistent with our strategic plan that we initiated ten months ago and have involved the efforts of many talented individuals across the country. Concurrently, we are engaged in developing critical partnerships to address areas of public health concern that involve the missions of multiple organizations.

## Integrative Research on Human Disease

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Environmental health science is not limited to an organ system, disease or population, but spans the full spectrum of human health and disease. The interdisciplinary nature of our work requires the right mix of specialists. As NIEHS increases its focus on common human diseases, interdisciplinary teams of scientists will be needed to integrate clinical, epidemiological, and toxicological research with basic mechanistic studies. To optimize the creation of these interdisciplinary research teams, I have begun a number of programmatic changes. I have created an Office of Translational Biomedicine that will re-focus the NIEHS intramural and extramural programs so that our basic research discoveries can be rapidly applied to improvements in human health. In our division of extramural research, I have initiated a new program, DISCOVER (Disease Investigation for Specialized Clinically Oriented Ventures in Environmental Research), that brings together extramural scientists with expertise in basic, clinical, and population-based research to focus on a disease related to environmental exposures. Among intramural investigators, I have developed a new program, the Director's Challenge, that also supports multidisciplinary research teams to attack basic problems, like inflammation and oxidative stress, that can be induced by environmental exposures and can influence the development of many different diseases. I am re-engineering our Environmental Health Science Research Centers so that they include a clinical component in their research, thus enhancing the disease focus and relevance of these centers. I have also directed funds to

build a new clinical research unit on campus so that our intramural research program can be integrated into human biology and human disease.

## Recruit and Train the Next Generation

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A more integrative approach to understanding complex human diseases will require innovative scientists with the type of training that can take advantage of new technologies and research opportunities. NIEHS has initiated a number of changes that address our future workforce needs. We have re-engineered our existing training programs so that we can better identify and encourage promising students at all levels to pursue careers in environmental health research. The existing T32 training grants program will be broadened to include other training opportunities in interdisciplinary research and genetics and genomics. We will also train physician-scientists by expanding our M.D., Ph.D. training program and by supporting young investigators in their transition to early faculty positions (developed a K12 training program). We have also instituted the Outstanding New Environmental Scientist, or ONES, award to help young, talented investigators make the transition from mentored to independent research. These grants will assist young scientists in launching innovative research programs focusing on problems of environmental exposures and human biology, human pathophysiology, and human disease by providing support for both the research and the start-up costs that are needed to establish a laboratory.

## Expand Community-linked Research

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The likelihood of exposure to environmental agents increases in economically disadvantaged communities and is associated with an excess disease burden in these communities. The NIEHS traditionally supports research relevant to understanding those health disparities and community concerns. We will continue to support research, both domestically and globally, that can offer insights into how to reduce exposures and disease in these settings. We will also be involved in developing quick responses to emerging environmental health issues, such as arose in the aftermath of Hurricane Katrina, when NIEHS launched a website that used a Global Information System to assess environmental hazards caused by the storm, as well as coordinated a local team of physicians and support staff to deliver medical care. Beginning in FY 2006, NIEHS is planning to support a research program to investigate the health consequences of Hurricane Katrina. This project will examine the role of genes, the environment, and gene-environment interaction in the exacerbation of airway disease from exposure to mold and microbial toxins in New Orleans following Hurricane Katrina.

## Re-evaluate Programmatic investments

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We have decided that investigator-initiated research needs to be prioritized at NIEHS and are rigorously re-evaluating other existing programs and approaches to determine if we need to re-conceptualize or eliminate some of these efforts. We have developed two new programs aimed at using environmental agents to understand basic mechanisms in human biology. One is the Epigenetics Initiative which explores intrauterine environmental and nutritional factors that can alter gene expression and generate developmental abnormalities or functional changes. The other is the Comparative Biology of Environmental Disease which uses novel "-omics" technologies and comparative biology approaches to study environmentally-relevant disease pathways. These studies will help us understand why people exposed to the same environmental stressors respond differently. Finally, we have reorganized the National Center for Toxicogenomics to insure a more timely and relevant product. In order to achieve these new programs and priorities, I have decided that the Comparative Mouse Genomics Centers Consortium has fulfilled its mission of infrastructure development and will not be re-competed.

## Gene, Environment and Health Initiative - A Novel Partnership

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Currently, we have inadequate techniques to precisely measure environmental exposures. This situation is in marked contrast to the robust tools that have been recently developed for the fields of genetics and genomics. To be able to assess the role that environmental exposures and genetic variation play in the risk of developing disease, we simply need more robust tools to measure the environmental exposures and the biological responses to these agents. While these tools are absolutely vital in moving the field of environmental health sciences forward, these tools will be invaluable to investigators in all areas of biomedical research. To further this goal, the NIH, with the support of the Secretary, has developed the Gene, Environment and Health Initiative. Our goal in this initiative is to develop tools to precisely measure individual biological responses to changes in our environment, diet, and activity level so that we can understand the relationship between various environmental exposures and human health and disease.

## NIEHS Strategic Plan - A New Outlook

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The NIEHS recently embarked on a strategic planning exercise, the final version of which can be viewed on our website and will soon be distributed in hardcopy. This document represents the efforts of many scientists and advocacy groups. I have been gratified by

the intense interest and involvement from citizens and scientists throughout the country. This document is truly a national plan that represents our collective wisdom of where environmental health sciences needs to go in order to reap full benefit of our investments and opportunities. Many of the suggestions have already been incorporated into our new programs and we will continue to design programs that are responsive to this plan.

## Summary

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The opportunities within environmental health sciences are greater than they have ever been. With our recent nationally supported strategic plan and the exciting partnerships that we are developing, it is my belief that environmental health sciences will continue to strengthen. With an improved relevance to major public health concerns, better technology for teasing out important environmental contributors to disease, an integrated approach to research, and a re-energized workforce, I expect the NIEHS to provide many of the important scientific advances of the future. Ultimately, this knowledge will be used to reduce the burden of many important diseases both in this country and abroad. I would be happy to answer any questions you might have.