



The National Institute of Environmental Health Sciences



The National Institute of Environmental Health Sciences (NIEHS) is one of 27 institutes and centers of the National Institutes of Health (NIH), which is a component of the U.S. Department of Health and Human Services (HHS). NIEHS is located in Research Triangle Park (RTP), North Carolina. NIEHS's broad focus on the environmental causes of disease makes the institute a unique part of the NIH. NIEHS is home to the National Toxicology Program (NTP), the nation's premier program for testing and evaluation of agents in our environment.

NIEHS Priority Areas and Programs

Some of the research areas being addressed at NIEHS include the following:

Autism

NIEHS-supported research has shown that there is more to autism than genetics alone, and that the interaction of genes and the environment must be considered in researching this devastating disorder. Scientists are investigating a number of environmental factors that are known or suspected to influence early development of the brain and nervous system, including exposure to infections, pesticides, air pollution, and metals, and parental age.



Air Pollution and Asthma

Air pollution is a mixture of natural and man-made substances in the air we breathe. NIEHS researchers are studying the effects of air pollution on respiratory diseases, such as asthma — one of our nation's most common chronic health condition. Many substances, including air pollution, can cause asthma attacks. NIEHS research is aimed at studying different approaches to prevent and treat this disease.

Cancer

NIEHS has made important strides in understanding what causes certain types of cancers. For example, NIEHS scientists played a lead role in the discovery of the first breast cancer susceptibility gene, BRCA1. NIEHS epidemiologists, through the Sister Study, are also beginning to uncover some of the environmental and genetic factors that influence breast cancer risk. Researchers that are part of the Breast Cancer and the Environment Research Program that NIEHS supports, along with the National Cancer Institute, are looking at exposures throughout a woman's life that could put her at risk for breast cancer. NIEHS also stands behind the "Breast Cancer and the Environment: [Prioritizing Prevention](#)" report it helped bring to fruition in 2013, which highlights the need for more emphasis on prevention, not just diagnosis and treatment.

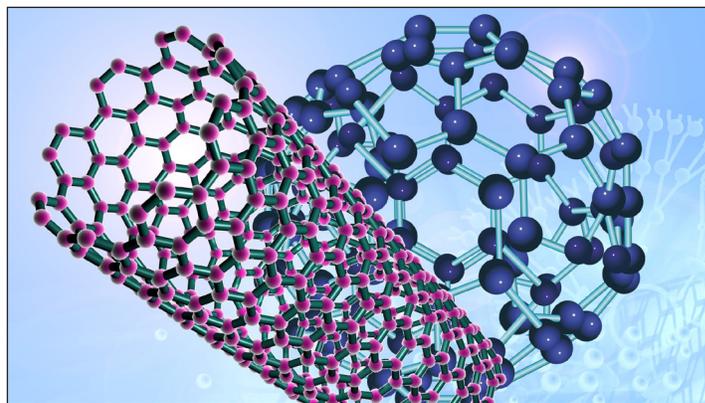


Climate Change and Human Health

Climate change and the actions taken to address it have significant effects on human health. NIEHS is taking a lead among federal agencies to understand the health effects of climate change, how strategies used to adapt to or lessen climate change might affect health adversely, and identify populations that may be most vulnerable. In 2014, NIEHS helped author the “[Third National Climate Assessment](#),” which provides a comprehensive overview of observed and projected climate change, and options for responding to these changes. NIEHS-supported research has also shown that strategies to reduce greenhouse gases can have immediate health benefits.

Developmental Basis of Adult Disease

Many diseases and conditions, such as obesity, type 2 diabetes, insulin resistance, asthma, cardiovascular diseases, neurodegenerative diseases, some cancers, and reproductive disorders, are thought to at least partly result from environmental exposures that occur in the womb or during childhood. Researchers are working to increase the knowledge of how certain diseases originate during critical windows of development, and identify environmental stressors that may change normal development in a way that leads to diseases later in life.



Nanomaterials

NIEHS has two primary interests in the field of nanotechnology — harnessing the power of engineered nanomaterials to improve public health, while at the same time understanding the potential risks associated with exposure to nanomaterials. Currently, very little is known about nanoscale materials and how they affect human health and the environment. NIEHS is committed to supporting the development of nanotechnologies that can be used to solve global problems in areas such as energy, water, medicine, and environmental remediation, while also investigating the potential risks these materials pose to human health and the environment.

Metal Toxicity

Research by NIEHS and others has shown that no amount of lead is safe. Exposure to lead can cause health problems in children and adults, such as lower IQ, high blood pressure, fertility problems, muscle and joint pain, and memory and concentration problems. As a result, lead has been removed from paints, gasoline, and cans used for food. Recent studies have shown that hexavalent chromium in drinking water causes cancer in laboratory animals. NIEHS researchers are also working to understand the toxic effects of arsenic, particularly at low levels.



Endocrine Disruptors

Endocrine disruptors are naturally occurring compounds or man-made chemicals that may interfere with the production or activity of hormones of the endocrine system, leading to adverse health effects. Chemicals that are known endocrine disruptors include bisphenol A (BPA), which is used to make polycarbonate plastics and epoxy resins; phthalates, such as DEHP, which are used in some consumer products and medical devices; dioxin and dioxin-like compounds; and some flame retardants. Many of these chemicals have been linked with developmental, reproductive, neurological, immune, and other problems in wildlife and laboratory animals. New research suggests that these chemicals may also adversely affect human health. NIEHS and NTP support research to understand how these chemicals work, and understand the effects they may have in various animal and human populations, with the long-term goal of working with other agencies and policymakers to develop prevention strategies.

“Advancing environmental health research offers us the best opportunity for preventing disease — because you can’t change your genes, but you can change your environment.”

Linda Birnbaum, Director

Predictive Toxicology

NIEHS and NTP are always looking for new ways to translate basic science observations into public health or medical applications. The Tox21 program, a collaborative effort between federal agencies, is developing more efficient and less time-consuming approaches to predict how chemicals may affect human health. Information from this, and other programs supported by NIEHS, can be used to make decisions about human health risks.



Pesticides

NIEHS places special emphasis on agricultural exposures. NIEHS joined with the National Cancer Institute, U.S. Environmental Protection Agency, and National Institute for Occupational Safety and Health to support the Agricultural Health Study, a prospective study exploring the health effects associated with pesticides and other agricultural exposures. Additionally, researchers across the country are also looking at the role pesticides may play in the development of diseases. Accumulating evidence indicates that pesticide exposure is associated with an increased risk for developing Parkinson’s disease.

Superfund

The NIEHS Superfund Program provides scientific research, through the [Superfund Research Program](#), and worker training, through the [Worker Education and Training Program](#), to address and prevent diseases caused by environmental contamination. These programs are closing the gap between the application of science to real world situations, such as safety and health training, and the need by policymakers and regulators for up-to-date scientific information.



What We Do: Public Health Impact

Since 1966, NIEHS has made many health research advances, and has been an important source of meaningful information for the public and decision makers.

The pioneering work of NIEHS researchers and grantees has shown the deadly effects of asbestos exposure, the developmental impairment of children exposed to lead, and the health effects of air pollution.

Federal and state regulatory, environmental, and public health agencies use NIEHS research to develop new standards to protect the health of people throughout the world.

Who We Are

NIEHS supports a wide variety of research programs directed toward preventing health problems caused by our environment.

Grants programs. The largest portion of the NIEHS budget goes to fund laboratory research, population-based studies, and training programs that are conducted at universities, hospitals, businesses, and organizations around the country and in other lands. This research is being supported through the NIH grants program — also known as the extramural program.

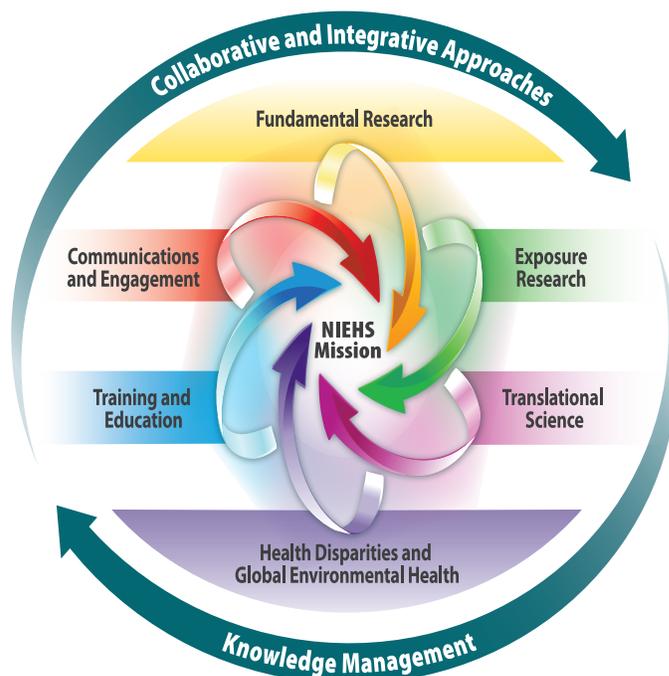
In-house laboratories. In-house, or intramural research, is done by scientists employed by the federal government who have laboratories at NIEHS. Research conducted at NIEHS includes epidemiology, biostatistics, molecular genetics, signal transduction, reproductive and developmental toxicology, respiratory biology, molecular carcinogenesis, and other environmental research areas. Our in-house scientists collaborate extensively with partners in other institutes, agencies, and academia. NIEHS also has a clinical research unit on site, to help translate basic research findings into human health gains.

National Toxicology Program. NTP is a federal, interagency program, headquartered at NIEHS, whose goal is to safeguard the public, by identifying substances in the environment that may affect human health. Current NTP initiatives are examining the effects of cell phone radiation, endocrine disruptors, and nanomaterials, as well as developing new approaches to advance high-throughput (high speed and high quantity) screening of chemicals, to reduce the number of animals used in research. NTP also conducts health hazard evaluations, such as the Report on Carcinogens, that are used by federal, state, and local health regulatory research agencies for decision-making.

Environmental Health Perspectives. NIEHS is also the publisher of Environmental Health Perspectives (EHP), a monthly journal of peer-reviewed research and news. With an impact factor of 7.26, EHP is a top-ranked monthly journal in environmental sciences. All EHP content is free online at <http://ehp03.niehs.nih.gov>.

Strategic Plan

NIEHS joined with stakeholders to develop the 2012-2017 *Strategic Plan — Advancing Science, Improving Health*. The plan serves as the foundation for the field of environmental health sciences.



This interactive, broad-themed research approach of NIEHS will allow us to meet the challenges of tomorrow head-on.



NIEHS and NTP Director Linda Birnbaum, Ph.D.

"NIEHS is the premier environmental health sciences research institution in the world."

- Appointed NIEHS director in January 2009
- First female and first toxicologist to head the Institute
- Nearly 35 years as a government scientist, including 19 years at the U.S. Environmental Protection Agency
- Author of more than 700 peer-reviewed publications, book chapters, and reports
- Former president of the Society of Toxicology
- Recipient of numerous awards and recognitions, including being elected to the Institute of Medicine of the National Academies, receiving a 2011 NIH Director's Award, Women in Toxicology Elsevier Mentoring Award, and 2013 American Public Health Association Homer N. Calver Award, and honorary degrees, including a 2014 honorary doctorate from Ben-Gurion University of the Negev in Beer-Sheva, Israel.

The mission of NIEHS is to discover how the environment affects people in order to promote healthier lives.

For more information on the National Institute of Environmental Health Sciences, visit our website at www.niehs.nih.gov