

National Institutes of Health

The National Institute of Environmental Health Sciences



Your Environment — Your Health

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).

Unlike the other NIH institutes, the NIEHS is located in Research Triangle Park (RTP), North Carolina. RTP is a science and technology hub located between Raleigh, Durham, and Chapel Hill.

The NIEHS is home to the National Toxicology Program (NTP), the nation's premier program for the testing and evaluation of agents in our environment.

The mission of the NIEHS is to reduce the burden of human illness and disability, by understanding how the environment influences the development and progression of human disease.

NIEHS's broad focus on the environmental causes of disease makes the institute a unique part of the NIH.

Who We Are

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

National Toxicology Program. The NTP is a federal, interagency program, headquartered at the 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, and to reduce the number of animals used in research. The NTP also works to understand individual susceptibility – why some people get sick when exposed to an environmental agent and others don't.

In-house laboratories. In-house, or intramural research, is done by scientists employed by the federal government who have laboratories at the NIEHS. Research conducted at the NIEHS include 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.

Grants programs. Research is done across the United States by researchers who have been funded through the NIH grants program – also known as the extramural program. 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.

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 6.12, EHP is the top monthly journal in public, environmental, and occupational health, and the second-ranked monthly journal in environmental sciences. All EHP content is free online at <http://ehp03.niehs.nih.gov>.



What We Do: Public Health Impact

Since 1966, the 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 calculate new standards to protect health of people throughout the world. Thousands of lives are saved and diseases prevented in the U.S. every year as a result of standards created under the Clean Air Act and the Safe Drinking Water Act. Actions taken by other agencies, such as the Centers for Disease Control and Prevention's recognition that even lower levels of lead in the blood are cause for concern and intervention, and the U.S. Food and Drug Administration's 2010 update on the chemical bisphenol A (BPA) expressing some concern for its effects on human health, help protect the health of the public and are based on NIEHS/NTP research results.

NIEHS Priority Areas and Programs

Endocrine Disruptors and Health

Endocrine disruptors are naturally occurring compounds or man-made chemicals that may be interfering with the production or activity of hormones of the endocrine system leading to adverse health effects. Many of these chemicals have been linked with developmental, reproductive, neurological, immune, and other problems in wildlife and laboratory animals. Some new research suggests that these chemicals may also adversely affect human health. The difficulty of assessing public health effects is challenging, because people are typically exposed to multiple endocrine disruptors simultaneously. The NIEHS and NTP support research to understand how these chemicals work, and to understand the effects they may have in various animal and human populations, with the long term goals of working with other agencies and policy makers to develop prevention strategies.

Cancer

The 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. Elucidating and understanding the causes of cancer, particularly the associations of exposure to environmental chemicals, hormones, radiation, metals, and other contaminants, and the mechanisms by which they act to cause direct, genetic, and epigenetic changes in the body that lead to cancer, continue to be priorities for the NIEHS.



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, toxins, biological agents, and parental age.

Nanomaterials

The 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 the materials. Currently, very little is known about nanoscale materials and how they affect human health and the environment. The 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. See *Since You Asked: Nanotechnology and NIEHS* <http://www.niehs.nih.gov/news/media/questions/sya-nano.cfm>.

Partnerships for Environmental Public Health (PEPH)

The NIEHS has been an innovator in promoting partnerships between community groups and researchers to address local, real-world environmental health concerns. It will continue its support of this effort through the new PEPH program (<http://www.niehs.nih.gov/peph>). PEPH is an umbrella program that reaches beyond traditional research models to more thoroughly integrate community needs and expertise into environmental health research, and to give communities the tools they need to promote health and reduce the risk of disease across populations at highest risk.

Climate Change and Human Health

Climate change and the actions taken to address it will likely have significant effects on human health. The NIEHS is taking a lead among federal agencies to understand the health effects of climate change and identify who may be most vulnerable. NIEHS-supported research has also shown that some strategies to reduce greenhouse gases can have immediate health benefits. This was demonstrated in a series of studies supported by NIEHS and released in *The Lancet* (<http://www.thelancet.com/series/health-and-climate-change>) in November 2009.



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 conditions. Many substances, including air pollution, can aggravate the severity of asthma symptoms. NIEHS research is aimed at studying different approaches to prevent and treat this disease.

Metal Toxicity

Research by the NIEHS and others has shown that exposure to lead can cause health problems, 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 also have shown that hexavalent chromium in drinking water causes cancer in laboratory animals. NIEHS researchers are also working to understand the toxic effects of cadmium, particularly at low levels.

Pesticides and Health

The NIEHS places special emphasis on agricultural exposures. NIEHS joins with the National Cancer Institute (NCI), the U.S. Environmental Protection Agency (EPA) and the National Institute for Occupational Safety and Health (NIOSH) to support the Agricultural Health Study, a prospective study exploring the health effects associated with pesticides and other agricultural exposures. Agricultural chemicals have increased food production to meet the needs of rising populations here and abroad, but can pose serious health risks at high exposures.

Superfund

NIEHS' Superfund Program provides scientific research, through the Superfund Research Program (SRP) <http://www.niehs.nih.gov/research/supported/srp/>, and worker training through the Worker Education and Training Program (WETP) http://www.niehs.nih.gov/careers/hazmat/about_wetp.cfm, 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 policy makers and regulators for up-to-date scientific information.



NIEHS/NTP Director Linda Birnbaum, Ph.D.

"The 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
- 30 years as a government scientist, including 19 years at the U.S. Environmental Protection Agency
- Author of more than 750 publications
- Former president of the Society of Toxicology
- Recipient of numerous awards, including the Women in Toxicology Elsevier Mentoring Award and the Society of Toxicology Public Communications Award

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