

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 (DHHS).

Mission Statement

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. To have the greatest impact on preventing disease and improving human health, the NIEHS focuses on basic science, disease-oriented research, global environmental health, and multidisciplinary training for researchers.

Location

NIEHS is located in Research Triangle Park (RTP), North Carolina. RTP is a science and technology hub created by the state of North Carolina between Raleigh, Durham and Chapel Hill.

Research

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 urban pollution. In 1994, former NIEHS Scientific Director Dr. Martin Rodbell was co-recipient of the Nobel Prize in medicine. That same year, NIEHS scientists played a key role in identifying the first breast cancer gene, BRCA1, and in 1995, identified a gene that suppresses prostate cancer. NIEHS is where genetically altered mice were developed – to improve and shorten the screening of potential toxins and to help develop aspirin-like anti-inflammatory drugs with fewer side effects.

The Institute funds centers for environmental health studies at universities across the United States, including Harvard, Oregon State, Vanderbilt, the University of California Davis, and MIT. This research promises exciting benefits in preventing disease. The breadth of the work and focus on

environmental causes of disease makes NIEHS a unique part of the National Institutes of Health.

Some of the most active areas of research are:

- Breast cancer and the environment
- Gene-environment interaction and genetic susceptibility
- Childhood cancer, respiratory diseases, birth defects
- Autoimmune disease and uterine fibroids
- Health disparities and environmental justice
- Alzheimer's and Parkinson's disease
- Identifying toxic substances

Federal regulatory agencies and public health agencies use our research findings to calculate new standards to protect health. Recent examples include EPA's new air quality standards for particulate matter, FDA's advisory on the laxative component, phenolphthalein, and CDC's lowering of the action level for blood lead. Scientific opportunities now exist to vastly improve the



relevance and timeliness of environmental health information. The foundation is laid and a new era of informed preventive care only awaits the fruition of the numerous projects initiated by the NIEHS.

Current Work

Health Disparities Research.

The National Institute of Environmental Health Sciences (NIEHS) has been a leader in the area of understanding how poverty, environmental pollution, and health interrelate. The NIEHS has developed a number of projects and grant programs designed to define the health disparities issue and to arm policy makers with the necessary information to reduce these disparities. Additionally the NIEHS has developed innovative grants programs aimed at empowering local communities to deal with the environmental health problems in their regions. Many of these efforts are outlined in this document.

Birth and developmental defects, sterility, breast and testicular cancers.

Some studies suggest average male sperm counts have sharply declined over the decades. Breast cancer and testicular cancers appears to have increased. NIEHS research seeks to discover how chemicals in the environment, including pesticides that mimic the hormone estrogen, might cause or stimulate these diseases.

Women's health. NIEHS scientists not only played a leading part in the discovery of the first breast cancer susceptibility gene, BRCA1, they are examining the environmental components of osteoporosis, which cripples many women and often leads to hip fractures and subsequent institutionalization. Investigators are also studying

the postmenopausal release of lead from bone, which can result in osteoporosis.

Alzheimer's and other neurologic disorders. Toxins in the environment may play a role in the Alzheimer's disease, Parkinson's, amyotrophic lateral sclerosis (Lou Gehrig's disease), and other disorders of the immune and endocrine systems. NIEHS research seeks to determine what roles solvents, pesticides and metals may play.

Lead poisoning. Although lead has been removed from paints, gasoline and cans used for food, lead in old paint continues to be a leading environmental hazard as it crumbles and is eaten by crawling infants or inhaled as dust. Lead also may have effects on fertility and in pregnancy. NIEHS is evaluating treatments including chelation drugs (which cause lead to leach from the body) and Vitamin D, iron and calcium.

Agricultural pollution. NIEHS puts special emphasis on agricultural exposures. Natural materials, such as grain dust, can induce lung diseases such as bronchitis. 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.

Signal error. Some environmental chemicals mimic the body's hormonal growth factors by activating receptor proteins at the cell surface that stimulate cell growth and division. NIEHS is investigating whether exposure to such chemicals contributes to the development of cancer or reproductive disorders.

Animal alternatives. NIEHS seeks to reduce the number of animals used in research, refine the design

of experiments to get the most information at least cost, and replace animals, when possible, by microbe and tissue cultures. NIEHS is a leader in the development of alternative test methods.

Applying the research. In order to help citizens, students and others find answers to questions about the possible impacts of waste sites, pesticides used on farms and in homes, lyme disease-carrying ticks, polluted water and air, power lines and electric and magnetic fields (EMF) health effects, NIEHS offers a number of Environmental Factsheets and Pamphlets, and Environmental Health Questions and Answers. In addition, through Superfund, NIEHS supports the Worker Education and Training Program for safety and health in hazardous waste handling and cleanup. NIEHS provides training for graduate students and postdoctorates and makes available visiting and staff fellow positions and visiting scientist positions – making the institute the principal federal agency for professional as well as public education on environmental health matters.

Markers. Just as you can spot measles by its rash, scientists are working to use indicators called biomarkers to better measure the body's exposure to and up-take of toxins. Ideally, these measurements could be made by sensitive, non-invasive tests. Ideally too, they could provide early warnings of exposures, predict the likely development of diseases – and help doctors intervene and prevent or limit these diseases.

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