“THE HUMAN CONNECTION”

The human race has always been connected to the environment. Throughout the ages our health has depended on air, water, and earth. It still does. But these are modern times, as reflected in our changing environment’s ever-changing impact on human life...

...the connection between our health and our surroundings. Here at the National Institute of Environmental Health Sciences, advanced biomedical research is finding new links between the environment and a spectrum of human diseases. NIEHS is the only one of the National Institutes of Health not located in Bethesda, Maryland. It’s unique in its focus not on a single organ or illness but on the relationship of the environment to a long list of health problems and the people they affect.

Surrounded by nature in Research Triangle Park, North Carolina. NIEHS researchers explain this complex interaction as an equation: genetics plus environment over time.

Allen Wilcox interview

The saying of “genetics plus environment over time” is a shorthand for a very complicated idea which is that people differ in their vulnerability to environmental toxins. They differ genetically. Because of their body chemistry certain people may be more sensitive to certain things than other people. We also differ in the stage of life we're at. The fetus is clearly more vulnerable to problems that could cause birth defects and even death than a young adult would be and similarly children and old people can be more vulnerable to the same exposure as an adult. And then when you factor in other things like illness of the person or their state of nutrition, you can see that there's a lot of variability in the population and that's the kind of thing here at the National Institute of Environmental Health Sciences we're trying to pin down.

Kenneth Olden interview

We address any human disease that has an environmental component, and most human diseases have an environmental component. That is, the disease is either caused by the environment, or it is exacerbated by the environment. For example, an individual inherits a predisposition to have asthma, but a kid is not always in crisis. In other words, there is an environmental trigger, so while you have the genetic constitution, everybody who has the genetic constitution is not in respiratory crisis.

The scientists at NIEHS study the environmental causes of disease in population groups at risk.

Teri Damstra interview

A number of diseases are unique to women or more prevalent in women, and the environment may play an important role. These include diseases such as breast cancer, osteoporosis, autoimmune disorders, fibroids, and endometriosis. Estrogen-like compounds present in the environment, for example, put women at risk for certain reproductive cancers. These compounds are a major focus of NIEHS research.

Research regarding the health affects of low level exposures to lead, particularly on cognitive and behavioral development of young children, has resulted in greatly reduced environmental exposures in recent years. Nevertheless, there are subpopulations of Americans with continuing high exposure to lead because of various risk-factors including living in houses with lead based paint, poor nutrition and low social-economic status. Current research is focused on understanding mechanisms of lead toxicity in order to reduce long term effects and to identify risk factors that contribute to exposure.

Walter Rogan interview

In 1994, we started a study that we called the Treatment of Lead Exposed Children Trial or TLC. This trial goes on in four US cities. It treats eventually over a thousand children, and the idea of the trial is to see whether we can prevent or reduce developmental delay in children that occurs because of low level lead exposure. The ultimate answer to lead poisoning is prevention but until these children and all children can live in lead-safe housing, we need to continue to look for means of preventing the consequences of lead exposure in children that have already been exposed to lead.

In today's hazardous world, the potential toxicity of thousands of chemicals demands to be understood. The NIEHS campus is home to the National Toxicology Program--the world's leader in designing, conducting, and interpreting chemical toxicity tests. With its massive chemical database, the NTP is the definitive source for toxicology-related information used by regulatory and research agencies, the scientific and medical communities, and the general public to protect public health and prevent human disease.

The Institute's contributions merit its high profile as the world's premier environmental health organization... publishing the only peer-reviewed scientific

journal devoted solely to environmental health research. This is where the biomedical world looks for current data.

The general public needs only to look at the headlines. The news traveled from coast to coast when a team of NIEHS scientists announced their discovery of the gene that causes breast and ovarian cancer. Likewise the announcement by NIEHS that its researchers had found the gene that halts the spread of prostate cancer in men. This groundbreaking pair of discoveries will directly impact lives by the hundreds of thousands.

Imagine the impact of Dr. Martin Rodbell's work. For helping discover the proteins responsible for communication within cells, the NIEHS scientist emeritus was awarded the Nobel Prize in Medicine in 1994. The discovery points to a new understanding of diseases ranging from cancer to alcoholism.

Jim Putney interview

For example, with such information we may be able to design pharmacological interventions to develop cures for diseases--diseases caused by environmental agents or in other areas as well. We may also be able to make predictions once we understand the mechanism of which chemicals and which sort of environmental factors may produce toxic effects in humans.

The Institute's far-reaching mandate extends from its labs in North Carolina to research centers nationwide.

Carl Barrett interview

In addition to the internal research we do at NIEHS, there's obviously a large amount of research going on in academic centers. But within the intramural program of the NIEHS, we try to understand not only what are the causes of human diseases and how environmental factors impact upon human health problems, but also to understand the basic mechanisms about how cells function, and how they communicate with each other.

Anne Sassaman interview

Research that's conducted outside the buildings here at Research Triangle Park is called extramural research. Our extramural research program supports investigators all over the country in medical centers, in universities, in research institutes, and in fact we have international programs that go beyond the boundaries of this country. The programs themselves range from individual research projects to a single investigator to large complex multidisciplinary

programs involving a number of investigators working with environmental health sciences.

Genetics plus environment over time. With the equation constantly changing over time, the NIEHS mandate extends to new generations and the scientists and physicians who'll carry on this critical work.

NIEHS supports a number of inspiring training programs throughout the country similar to the Institute's "Summers of Discovery" gives talented young people a first-hand experience of biomedical research...and our national Institute's pivotal role in the health of every citizen. From discovery, to public policy, to a global model of the relationships between environment and health.

It all connects in central North Carolina, at the National Institute of Environmental Health Sciences. It's connected as long as human beings occupy the earth.