

# Exploring environmental links to cancer

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"Why me?" It's a hauntingly simple question that people often ask after learning they have cancer. Why did they get the disease while others, exposed to the same risks, remain healthy? There is no simple answer.

Recent studies suggest that heredity alone accounts for only about 15 percent of an individual's risk of developing cancer. Susceptibility to the disease is most likely determined by a complex interplay of genes, aging, lifestyle choices such as smoking, and exposures to environmental contaminants. A report from the National Cancer Institute and the National Institute of Environmental Health Sciences finds that cancers linked to lifestyle choices and environmental causes comprise at least 80 percent of cases.

Researchers have for years explored the roles of genes, aging and lifestyle choices. But we know less about the role of environmental factors.

Records documenting exposures to pesticides and other contaminants worldwide are spotty. Few studies have documented the molecular mechanisms through which these chemical compounds can trigger the expression of genes linked to cancer.

A new research partnership at Duke University aims to help change that.

Scientists at Duke's Nicholas School of the Environment and Earth Sciences and the Duke Comprehensive Cancer Center are pooling their expertise to explore how environmental agents interact with genes to determine when, or if, cancer occurs.

A unique focus of the partnership will be the use of nontraditional animal models such as nematodes to study the effects of chronic exposures to multiple carcinogens in large populations. Information gleaned from such

studies will help scientists identify the molecular mechanisms at work, and better understand how they operate during windows of vulnerability when people are more susceptible to the disease. Ultimately, this knowledge may lead to new drugs and therapies.

## A global concern

In many developing countries, industrialization is changing the environment. Cancer is becoming a problem where it never was before. In remote villages along China's Shaying River, for example, the number of cancer cases has spiked from dozens a year to hundreds since heavy industry came to the river's banks in the 1980s.

In the United States, regulations and monitoring help prevent carcinogens from entering our food and water. But the sheer

volume of products and substances produced to improve our daily lives makes continuing vigilance a pillar of environmental management. Recent studies at Duke's Cancer Center, for instance, have linked exposure to the drug valproic acid, and to an industrial solvent known as EGME, to increased estrogen and progesterone levels. This may increase the risk of breast cancer.

Since World War II, more than 80,000 synthetic chemicals have been introduced into commerce worldwide, yet less than seven percent have been evaluated fully for their impacts on human health and the environment.

We will never be able to identify or eliminate all carcinogens from the environment. But through sound science and creative partnerships, we can reduce the risks, so that fewer patients have to grapple with the awful question, "Why me?"



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