

Microplastics Discovered in Prostate Tumors

Pilot study represents some of the first direct evidence linking microplastics to prostate cancer, the most common kind among American men.

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Small fragments of plastic were found in 9 out of 10 patients with [prostate cancer](#), and in higher levels inside tumors than in nearby noncancerous tissue, a new study finds.

The small, single-center study was led by researchers at NYU Langone Health, its [Perlmutter Cancer Center](#), and its [Center for the Investigation of Environmental Hazards](#). It explored the potential role of plastic exposure in development of prostate cancer, which is the most common cancer among American men, according to the American Cancer Society.

Experts have found that when plastic from food packaging, cosmetics, and other sources is used, heated, or chemically treated, it can break down into smaller pieces and become ingested. People are also exposed to plastics by inhaling them from the air and by absorbing them through the skin. Past studies have identified these microplastics in nearly every human organ, as well as in body fluids and the placenta. However, how they may affect human health has remained poorly understood.

Analyzing tissue samples collected from 10 patients with prostate cancer, the research team identified plastic particles in 90% of tumor samples and 70% of benign tissue samples.

In addition, the cancerous tissue contained on average 2.5 times the amount of plastic as the healthy prostate tissue samples (about 40 micrograms of plastic per gram of tissue compared with 16 micrograms per gram).

“Our pilot study provides important evidence that microplastic exposure may be a risk factor for prostate cancer,” said study lead author [Stacy Loeb, MD](#), a professor in the NYU Grossman School of Medicine’s Departments of [Urology](#) and [Population Health](#).

According to Dr. Loeb, although early data had suggested a link between microplastics and other health conditions such as heart disease and dementia, there had been little direct evidence connecting the substances to prostate cancer.

Bring presented during the [American Society of Clinical Oncology's Genitourinary Cancers Symposium](#) on February 26, the new study is the first Western assessment of its kind to examine microplastic levels in prostate tumors and to compare them with plastic buildup in noncancerous prostate tissue, said Dr. Loeb.

For the investigation, the researchers evaluated patients with prostate cancer who were undergoing a surgical procedure to remove the entire organ. The team analyzed tumor and benign samples visually and then used specialized equipment to determine the amount of microplastic particles, as well as their chemical composition and structure, in the tissue. The scientists focused on 12 of the most common types of plastic molecules.

To avoid contaminating the samples with the many kinds of plastic in common medical and laboratory equipment, the team substituted its tools with those made of aluminum, cotton, and other nonplastic material. They also handled the samples in highly controlled spaces known as clean rooms that are designed to process samples for microplastic analysis.

“By uncovering yet another potential health concern posed by plastic, our findings highlight the need for stricter regulatory measures to limit the public’s exposure to these substances, which are everywhere in the environment,” said study senior author [Vittorio Albergamo, PhD](#).

Dr. Albergamo, an assistant professor in the NYU Grossman School of Medicine’s [Department of Pediatrics](#), added that the research team next plans to examine what microplastics do in the body and how they might lead to cancer development. A possibility they plan to explore, he noted, is that the particles may prompt an overactive immune response (inflammation) in the tissue, which over time can damage cells and trigger genetic changes that cause cancer cells to form.

Dr. Albergamo cautions that a larger sample of patients will be needed to confirm the study findings.

About one in eight men in the United States will be diagnosed with prostate cancer at some point in their lifetime, according to the Centers for Disease Control and Prevention.

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Along with Dr. Loeb and Dr. Albergamo, NYU Langone researchers involved in the study are [Leonardo Trasande, MD, MPP](#); Trevor Johnson, PhD; [Fang-Ming Deng, MD, PhD](#); Mark Strong, DO; [David Wise, MD, PhD](#); José Alemán, MD, PhD; Zixuan Mo, BS; Mariana Rangel Camacho, BS; Nataliya Byrne, BA; Tatiana Sanchez Nolasco, MPH; Adrian Rivera, MPH; William Huang, MD; [Herbert Lepor, MD](#); [Wei Phin Tan, MD](#); and [James Wysock, MD](#). Another study co-investigator is Samir Taneja, MD, at Northwell Health in New York City.

Dr. Loeb has consulted for pharmaceutical company Astellas, digital health company Savor Health, and men’s health organization Movember, and has received research support from Endo USA Inc. She also participated in advisory boards for Endo USA, Blue Earth Diagnostics, Pfizer, Sumitomo Pharma, and Doceree. Dr. Wysock has consulted for medical equipment manufacturers

Edap—Focal One and URO-1 Medical. Dr. Wise is a paid consultant for Pfizer, Bayer, K36, OncoC4, AstraZeneca, and Janssen Pharmaceuticals, and is an expert witness for Exxon Mobil. None of these activities is related to the current study. NYU Langone Health is managing the terms and conditions of these relationships in accordance with its policies and procedures.

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