

PFASs, chemicals commonly found in environment, may interfere with body weight regulation

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A class of chemicals used in many industrial and consumer products was linked with greater weight gain after dieting, particularly among women,

according to a study led by Harvard T.H. Chan School of Public Health. The chemicals—perfluoroalkyl substances (PFASs)—have been linked with cancer, hormone disruption, immune dysfunction, high cholesterol, and obesity.

The study also found that higher blood levels of PFASs—known as "obesogens" because they may upset [body weight](#) regulation—were linked with lower resting metabolic rate (RMR), or slower metabolism after [weight loss](#). Metabolism refers to the chemical processes in the [body](#) that convert energy from food, commonly known as "burning calories." People with a lower RMR, or slower metabolism, burn fewer calories during normal daily activities and may have to eat less to avoid becoming overweight.

The study will be published online February 13, 2018 in *PLOS Medicine*.

"Obesogens have been linked with excess [weight](#) gain and obesity in animal models, but human data has been sparse. Now, for the first time, our findings have revealed a novel pathway through which PFASs might interfere with human body weight regulation and thus contribute to the obesity epidemic," said senior author Qi Sun, assistant professor in the Department of Nutrition at Harvard Chan School.

PFASs have been used for more than 60 years in products ranging from food wrappers to clothing to pots and pans, and studies have shown that they've contaminated drinking water near industrial sites, military bases, and wastewater treatment plants. These chemicals can accumulate in drinking water and food chains and persist for a long time in the body.

The researchers, with colleagues from Louisiana State University and Tulane University, analyzed data from 621 overweight and obese participants in the Prevention of Obesity Using Novel Dietary Strategies (POUNDS LOST) clinical trial, which was conducted in the mid-2000s.

The trial tested the effects of four heart-healthy diets on weight loss over a period of two years. Researchers looked at the possible connection between the amount of PFASs in participants' blood as they entered the study and their weight loss or gain over time.

During the first six months of the trial, participants lost an average of 6.4 kilograms (kg), but regained 2.7 kg over the course of the following 18 months. Those who gained the most weight back also had the highest blood concentrations of PFASs, and the link was strongest among women. On average, women who had the highest PFAS blood levels (in the top third) regained 1.7-2.2 kg more body weight than women in the lowest third.

In addition, the study found that higher blood concentrations of PFASs were significantly associated with lower resting metabolic rates.

"We typically think about PFASs in terms of rare health problems like cancer, but it appears they are also playing a role in obesity, a major health problem facing millions around the globe," said study co-author Philippe Grandjean, adjunct professor of environmental health at Harvard Chan School. "The findings suggest that avoiding or reducing PFAS exposure may help people maintain a stable body weight after they successfully lose some weight, especially for women."

More information: "Perfluoroalkyl Substances and Changes in Body Weight and Resting Metabolic Rate in Response to Weight-Loss Diets: A Prospective Study," *PLOS Medicine* (2018). [DOI: 10.1371/journal.pmed.1002502](https://doi.org/10.1371/journal.pmed.1002502)

Provided by Harvard T.H. Chan School of Public Health

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