

detection frequencies to illustrate the lowest average molecular weight (230.038 g/mol) and highest (514.086 g/mol) among the PFAS shown. Credit: *Journal of Exposure Science & Environmental Epidemiology* (2024). DOI: 10.1038/s41370-023-00626-x

Researchers from the GenX Exposure Study detected PFAS originating from a fluorochemical manufacturing plant—including Nafion byproduct 2 and GenX—in nearby private wells in Bladen and Cumberland Counties, N.C. PFAS refers to a group of chemicals called per and poly-fluoroalkyl substances.

"These compounds were released to the environment through air and wastewater emissions from the facility," says Nadine Kotlarz, a research scholar in the Department of Biological Sciences at North Carolina State University and a member of NC State's Center for Human Health and the Environment (CHHE), and corresponding author of the paper.

"Air released from the facility caused the contamination of groundwater and private wells," Kotlarz says. "In order to study how exposure to these chemicals may affect [human health](#), we need to know the exposure levels across impacted people."

In February 2019, the researchers recruited 153 people from this region who used 84 private wells to participate in the GenX Exposure Study. The participants lived within six miles of the fluorochemical facility. The participants provided well water and blood samples and filled out questionnaires about their well-water consumption.

The water and [blood samples](#) were screened for nine PFAS produced by the facility, including GenX and Nafion byproduct 2.

The PFAS found most frequently and at the highest concentrations in the wells included several low molecular weight PFAS (PMPA, PEPA, GenX, PFO₂H_xA, PFMOAA). The median concentration of GenX in the wells was 107 nanograms per liter (ng/L), 10 times higher than the U.S. Environmental Protection Agency's (EPA) drinking water health advisory level of 10 ng/L.

However, these PFAS were not frequently detected in the private well users' blood, even though they drank the well water.

Nafion byproduct 2, a higher molecular weight PFAS with a longer half-life, was detected frequently in wells at lower concentrations (the median concentration was 14 ng/L) and detected in more than half of participants' blood.

"With Nafion byproduct 2, we saw that higher well-water concentration and the longer a person lived at their home correlated with higher blood levels," Kotlarz says. "Well-[water consumption](#) is having an impact on exposure, and we know that several other PFAS were present in the wells, but due to the short half-lives of some PFAS (like GenX) in the body, we didn't find all of the well water PFAS in blood.

"Blood levels of a chemical across a population are often used to characterize exposure," Kotlarz says. "Without [blood levels](#), we will need to estimate exposure to PFAS such as GenX another way in order to study their potential health effects."

The paper is [published](#) in the *Journal of Exposure Science & Environmental Epidemiology*.

More information: Nadine Kotlarz et al, Per- and polyfluoroalkyl ether acids in well water and blood serum from private well users residing by a fluorochemical facility near Fayetteville, North Carolina,

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