Researchers have discovered that used breast implants can be used to measure persistent environmental pollutants in human bodies.

Every day we are all exposed to small amounts of many different persistent pollutants. These pollutants accumulate in the body and can disrupt fetal development, decrease muscle and nerve functions and even cause death.

To know more about how persistent pollutants affect us, effective ways of measuring their occurrence are needed.

Looking for pollutants

In a pilot study, researchers obtained permission from 22 women (close to 100 percent of the women asked) to analyze their used silicone implants.

"We discovered that we can get reliable data on the total body burden of persistent pollutants by analyzing the silicone within the used breast implants," says Ian Allan.

Allan is a research scientist at the Norwegian Institute for Water Research (NIVA). He believes that used silicone implants can complement breast milk, blood and other existing sample materials in the search for persistent pollutants that accumulate in the body.

Modern silicone implants consist of a soft shell containing a viscous silicone gel. They have a life span of about ten to fifteen years, and then need replacing.

"Current practice is to throw used silicone implants into the trash, but we want to intercept them before that happens, enabling us to preserve and study them in our lab," says Allan.

Making use of old implants

The women who have participated in the pilot study are all patients at a medical clinic in Oslo. Helge E. Roald coordinated the effort on the clinic’s part, and the Chief physician and specialist in plastic surgery is happy to have been a part of the study.

"Breast implants are often viewed in a negative light. It is exciting to be part of a study where the implants have a positive effect, by making us smarter about environmental pollutants," Roald says.

NIVA researchers have been working with silicone as a sampling tool for many years. Typically, thin strips of silicone are placed in water, sediments and air to collect traces of pollutants over time. NIVA’s Director of Innovation, James Berg, explains the link to the breast implant studies.

"Our researchers recently implanted brown trout with silicone, using it as a tool to measure PCB and other
chemicals within the living fish. This in turn sparked the idea for research on used silicone breast implants.

In an innovation context, this is true out of the box thinking by our researchers, and analysis of used implants can prove to be of extraordinary value to society," Berg says.

Scientific work remains to further enhance the method of silicone implant analysis and the researchers are eager to learn more. As it stands, thousands of used silicone implants go to waste each year. If the research gets funded and used implants are intercepted, the researchers can instead learn more about how persistent environmental pollutants affect us.

"This is the all-important first step in defeating the enemy that the pollutants represent to us all," concludes Allan.

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Read the Norwegian version of this article at forskning.no

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Researchers make use om old silicone breast implants. (Photo: Colourbox)

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Ian Allan. (Photo: NIVA)

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Breast_implants_in_hand_01.jpg

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Ian Allan, Alfild Kringstad, Helge E. Roald, Kine Bæk and Kevin V. Thomas (2013) Should silicone prostheses be considered for specimen banking? A pilot study into their use for human biomonitoring?

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