

Progress in hunt for unknown compounds in drinking water

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An unknown number of byproducts are formed in the drinking water treatment process, and scientists don't know what many of them are. However, using advanced technology, researchers at Linköping

University have been able to detect new compounds, and report that every water treatment plant has a unique combination.

Swedish [water treatment](#) plants work hard to ensure the high quality of drinking water. In order to prevent the spread of diseases, the plants must chlorinate the water. But chlorination can lead to the formation of byproducts that can be hazardous to health.

Normally, tests are conducted for a small number of known by-products in drinking water, including trihalomethanes (such as chloroform), which are regulated by the Swedish National Food Agency. Now, a collaboration between researchers at Linköping University (LiU) and various water treatment plants has resulted in new advances in the hunt for by-products in drinking water.

"Using advanced technologies, we've been able to trace more compounds that were detected at the molecular level. It turned out that most of the by-products were unique to each [water treatment plant](#). This means that specific conditions at each plant affect which by-products are formed," says Anna Andersson, doctoral student at LiU's TEMA M-Environmental Change.

For one year, Andersson worked closely with four Swedish water treatment plants, each with different raw water and treatment processes, taking samples of the water. The results showed that even at the plants where no traces of the regulated trihalomethanes were detected, a wide range of other by-products was present.

The researchers were also able to detect a large variation of by-products at the [plants](#) that use chloramine, a milder form of chlorination, in the treatment process.

Chlorination important to prevent spread of disease

The large variation of by-products makes it difficult to know how to best reduce the health risks of these compounds.

"Sometimes, people talk about the cocktail effect, and that's what we're faced with here. What we have to understand is how we can reduce the risk of the entire mixture of compounds. The risks of the individual by-products that have been identified are unknown, but the potential risk of the cocktail is reason enough to try to reduce the formation of by-[products](#)," says Anna Andersson.

Chlorination is one of our most important defenses against bacteria in [drinking](#) water, and it plays an important role in ensuring good water quality throughout the supply network. The researchers are trying to discover how to continue to use chlorination effectively while reducing the exposure of unwanted byproducts.

More information: Anna Andersson et al, Waterworks-specific composition of drinking water disinfection by-products, *Environmental Science: Water Research & Technology* (2019). [DOI: 10.1039/C9EW00034H](#)

Provided by Linköping University

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