

Researchers find a link between pollutants and certain complications of obesity

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A team of researchers at the IRCM in Montréal led by Rémi Rabasa-Lhoret, in collaboration with Jérôme Ruzzin from the University of Bergen in Norway, found a link between a type of pollutants and certain metabolic complications of obesity. Their breakthrough, published online this week by the *Journal of Clinical Endocrinology & Metabolism*, could eventually help improve the prevention, diagnosis, and treatment of cardiometabolic risk associated with obesity, such as diabetes, hypertension and cardiovascular disease.

Although [obesity](#) is strongly linked to insulin resistance and type 2 diabetes, a subset of [obese individuals](#), termed "metabolically healthy but obese", appears relatively protected from the development of such cardiometabolic complications. IRCM researchers are studying the factors that seem to protect obese individuals who remain metabolically healthy, in an attempt to find therapeutic avenues to prevent complications for others who are at risk.

"Recently, [persistent organic pollutants](#) (POPs) have been found to accelerate the development of prediabetes and obesity in mice, thereby mimicking the unfavourable cardiometabolic profile characteristic of certain obese individuals," says Rémi Rabasa-Lhoret, MD, PhD, endocrinologist and Director of the Metabolic Diseases research unit at the IRCM. "As a result, the aim of our study was to test whether metabolically healthy but obese individuals have lower circulating levels of POPs than obese individuals with cardiometabolic complications."

Persistent organic pollutants are man-made chemicals used in agricultural, industrial and manufacturing processes. Due to their toxicity, POPs have been strictly and internationally regulated to ensure public health. However, because they have the ability to resist environmental degradation, POPs can still be found all around the world, even in areas where they have never been used, and remain omnipresent in our environment and food products. Thus, virtually all humans are exposed to POPs daily.

"Exposure to POPs comes primarily from the environment and the consumption of food such as fatty fish, meat and milk products," explains Jérôme Ruzzin, PhD, expert in the field of research on POPs. "One important characteristic of POPs is their lipid solubility, meaning they accumulate in the body's fatty tissues. As their name suggests, they are also persistent so the body cannot easily eliminate them. POPs can therefore have significant impacts on human health, and have been shown to affect reproduction, promote cancer, and be involved in the development of metabolic diseases."

IRCM researchers conducted a study of 76 obese women of similar age, body mass index and fat mass index, in which they analyzed the concentration of 21 POPs, as well as cardiometabolic risk factors. Among 18 detectable pollutants, the women with cardiometabolic complications had higher concentrations of 12 POPs.

"Remarkably, close to 70 per cent of the detectable POPs were significantly higher in individuals with cardiometabolic complications compared to metabolically healthy but obese subjects," adds Marie-Soleil Gauthier, PhD, co-first author of the study and research associate at the IRCM. "Our study confirms that the two groups have distinct POP profiles, and that metabolically healthy but obese individuals have significantly lower circulating levels of various classes of POPs than patients with complications. A better understanding of the role of POPs

could lead to new directions for the prevention, diagnosis, and treatment of cardiometabolic risk associated with obesity."

"Although this study does not show a causal link, it suggests that pollutants found abundantly in our environment could promote the development of cardiometabolic diseases like diabetes," concludes Dr. Rabasa-Lhoret. "If future studies confirm this increased risk, such observations could have a significant impact on public health decisions because we will need to dramatically reduce our exposure to these pollutants."

More information: *The Journal of Clinical Endocrinology & Metabolism*. [DOI: 10.1210/jc.2013-3935](https://doi.org/10.1210/jc.2013-3935)

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