

BPA substitute can trigger fat cell formation

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Exposure to a substitute chemical often used to replace bisphenol A in plastics can encourage the formation of fat cells, according to a new study published in the Endocrine Society's journal *Endocrinology*.

The replacement chemical, bisphenol S, has a slightly different chemical structure than bisphenol A (BPA), a known endocrine disruptor. As of 2014, nearly 100 epidemiological studies have been published tying BPA to health problems, according to the [Introductory Guide to Endocrine-disrupting Chemicals](#) published by the Society and IPEN, a global network that supports sound chemicals management.

Concerns about BPA's health effects have encouraged some consumers to purchase food containers labeled "BPA-free". BPA-free products often contain [bisphenol S](#) (BPS) or other substitutes, but researchers have raised concerns that these replacements also interfere with the body's hormones and may pose similar threats to public health.

"Our research indicates BPS and BPA have comparable effects on fat [cells](#) and their metabolism," said the study's senior author, Ella Atlas, PhD, of Health Canada, the federal department responsible for helping Canadians maintain and improve their [health](#). "The study is the first to show that BPS exposure can induce the formation of human fat cells."

The Canadian researchers created a human cell model to test the effects of BPS exposure. They used [human cells](#) called preadipocytes - [undifferentiated cells](#) that can develop into [fat cells](#) - taken from the hip, thigh or abdomen of female volunteers. Groups of cells were exposed to

various concentrations of BPS during a 14-day period. For comparison purposes, some cells were exposed to the chemical dexamethasone instead because it triggers a known rate of fat cell formation and accumulation of lipids, or fat-like substances that collect in the blood and tissue.

Researchers found that the cells exposed to the smallest amounts of BPS as well as the cells exposed to the highest concentrations exhibited the largest accumulation of lipids, while moderate amounts had a smaller effect. Exposure to even tiny amounts of endocrine-disrupting chemicals can interfere with the functioning of hormones, since small changes in hormone levels are designed to trigger adjustments in metabolism, respiration, heart rate and other bodily functions.

"Since BPS is one of the replacement chemicals used in consumer products that are marketed as BPA-free, it is important to examine whether BPS acts as an endocrine-disrupting chemical," Atlas said. "This study shows that BPS and BPA have similar effects on fat cell formation, lipid accumulation and expression of genes important for lipid metabolism."

Other authors of the study include Jonathan G. Boucher and Shaimaa Ahmed of Health Canada's Environmental Health Science and Research Bureau in Ottawa, Canada.

The study, "Bisphenol S Induces Adipogenesis in Primary Human Preadipocytes from Female Donors," will be published online at <http://press.endocrine.org/doi/10.1210/en.2015-1872>, ahead of print.

More information: <dx.doi.org/10.1210/en.2015-1872>

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