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'Inherently toxic' chemical faces its future

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FROM SATURDAY'S GLOBE AND MAIL

Bisphenol A is ingested by practically everyone in Canada who eats canned foods or drinks from a can or hard plastic water bottles.

Now a controversy is raging over the safety of widespread public exposure to the chemical, which is known to act like a synthetic female sex hormone.

At the heart of the intense debate over bisphenol A is that it challenges the main tenet of modern toxicology, the idea that the dose makes the poison, a principle credited to the 15th-century Swiss alchemist Theophrastus Paracelsus.

Under this principle, a two-pack-a-day smoker is more at risk of cancer than a one-pack-a-day user, and the belief that rising doses make a substance more dangerous is the basis of all government regulations that seek to set safe exposures for harmful chemicals.

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Jennifer Story and husband Rick Smith of Toronto, with five-month-old son Owain, recently ditched their plastic baby bottles in favour of glass due to the use of Bisphenol A in the bottle linings. (*Charla Jones/Globe and Mail*)

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- **Graphic:** Adverse effects of Bisphenol A in laboratory animals

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It seems obvious that a high dose of a poison would be more dangerous than a lower one, but bisphenol A is creating a stir because it doesn't follow this seemingly common-sense rule. Researchers say this oddity results from the fact that bisphenol A isn't a conventional harmful agent, such as cigarette smoke, but behaves in the unconventional way typical of hormones, where even vanishingly small exposures can be harmful.

This is why some environmentalists and scientists contend that bisphenol A, which leaches in trace amounts from food and beverage packaging, is among the scariest manufactured substances in use, an eerie modern version of the vaunted lead water pipes by which ancient Romans were unknowingly poisoned.

Extrapolating from the results of animal experiments, they suspect bisphenol A has its fingerprints all over the unexplained human health trends emerging in recent decades hinting at something going haywire with sex hormones, including the early onset of puberty, declining sperm counts, and the huge increase in breast and prostate cancer, among other ailments.

But manufacturers — which include some of the world's biggest chemical companies — insist bisphenol A is harmless and say those claiming otherwise have it wrong.

Welcome to the heated controversy over bisphenol A.

Derived from petroleum, bisphenol A is the chief ingredient in polycarbonate, the rigid, translucent hard plastic used in water bottles and many baby bottles. It's also used to make the resins that line most tin cans, dental sealants, car parts, microwaveable plastics, sports helmets and CDs.

Environment Canada and Health Canada last year selected it as one of 200 substances that a preliminary review deemed possibly dangerous and in need of thorough safety assessments. The 200 were culled as the most worrisome chemicals from among about 23,000 substances in use in the 1980s and grandfathered from detailed safety studies when Canada adopted its first modern pollution laws.

Government scientists classified bisphenol A as "inherently toxic," and companies making it will be challenged by the assessment to prove that continued use is safe.

The assessment is expected to begin next month and provide a glimpse into one of the biggest public-health and scientific controversies in the world.

Some researchers with close-up views of bisphenol A are so shocked by its ability to skew development in their laboratory animals, even at among the lowest doses ever used in experiments, they aren't waiting for the government to ban it. In their personal lives, they can't run away from products containing it fast enough. "I would love to see it banished off the face of the Earth," Dr. Patricia Hunt, a Washington State University geneticist, said.

She began ditching her bisphenol-A-containing products after discovering that mere traces of the chemical were able to scramble the eggs of her lab mice. In humans, similar damage would lead to miscarriages and birth defects, such as Down syndrome. "I thought, 'Oh my God,'f!" she said. "I'm going to throw out every piece of plastic in my kitchen."

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