

## Mother's exposure to bisphenol A may increase children's chances of asthma

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For years, scientists have warned of the possible negative health effects of bisphenol A, a chemical used to make everything from plastic water bottles and food packaging to sunglasses and CDs. Studies have linked BPA exposure to reproductive disorders, obesity, abnormal brain development as well as breast and prostate cancers, and in January the Food and Drug Administration announced that it was concerned about "the potential effects of BPA on the brain, behavior and prostate gland of fetuses, infants and young children."

Now, mouse experiments by University of Texas Medical Branch at Galveston researchers have produced evidence that a mother's exposure to BPA may also increase the odds that her children will develop asthma. Using a well-established mouse model for asthma, the investigators found that the offspring of female mice exposed to BPA showed significant signs of the disorder, unlike those of mice shielded from BPA.

"We gave BPA in drinking water starting a week before pregnancy, at levels calculated to produce a body concentration that was the same as that in a human mother, and continued on through the pregnancy and lactation periods," said UTMB associate professor Terumi Midoro-Horiuti, lead author of a paper on the study appearing in the February issue of [Environmental Health Perspectives](#).

Four days after birth, the researchers sensitized the baby mice with an allergy-provoking ovalbumin injection, followed by a series of daily

respiratory doses of ovalbumin, the main protein in egg white. The investigators then measured levels of antibodies against ovalbumin and quantities of inflammatory [white blood cells](#) known as [eosinophils](#) in the lungs of the mouse pups. They also used two different methods to measure lung function.

"What we were looking for is the asthma response to a challenge, something like what might happen if you had asthma and got pollen in your nose or lungs, you might have an [asthma attack](#)," said UTMB professor Randall Goldblum, also an author of the paper. "All four of our indicators of asthma response showed up in the BPA group, much more so than in the pups of the nonexposed mice."

The UTMB researchers said that although more work is needed to determine the precise mechanism of that response, it almost certainly has its roots in the property of BPA thought to contribute to other health problems: its status as an "environmental estrogen." Environmental estrogens are natural or artificial chemicals from outside the body that when consumed mimic the hormone estrogen, activating its powerful biochemical signaling networks in often dangerous ways. In a 2007 Environmental Health Perspectives paper, for example, Midoro-Horiuti, Goldblum and UTMB professor and current study co-author Cheryl Watson described how adding small amounts of environmental estrogens into cultures of human and mouse mast cells — common immune cells packed with allergic response-inducing chemicals such as histamine — produced a sudden release of allergy-promoting substances.

"Our results show that we have to consider the possible impact of environmental estrogens on normal immune development and on the development and morbidity of immunologic diseases such as asthma," Midoro-Horiuti said. "We also need to look at doing more epidemiological studies directly in humans, which is possible because BPA is so prevalent in the environment — all of us are already loaded

with it to a varying extent. For example, it should be possible to determine if children who have more BPA exposure are more likely to develop [asthma](#)."

**More information:** "Maternal Bisphenol A Exposure Promotes the Development of Experimental Asthma in Mouse Pups," *Environmental Health Perspectives*.

Provided by University of Texas Medical Branch at Galveston

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