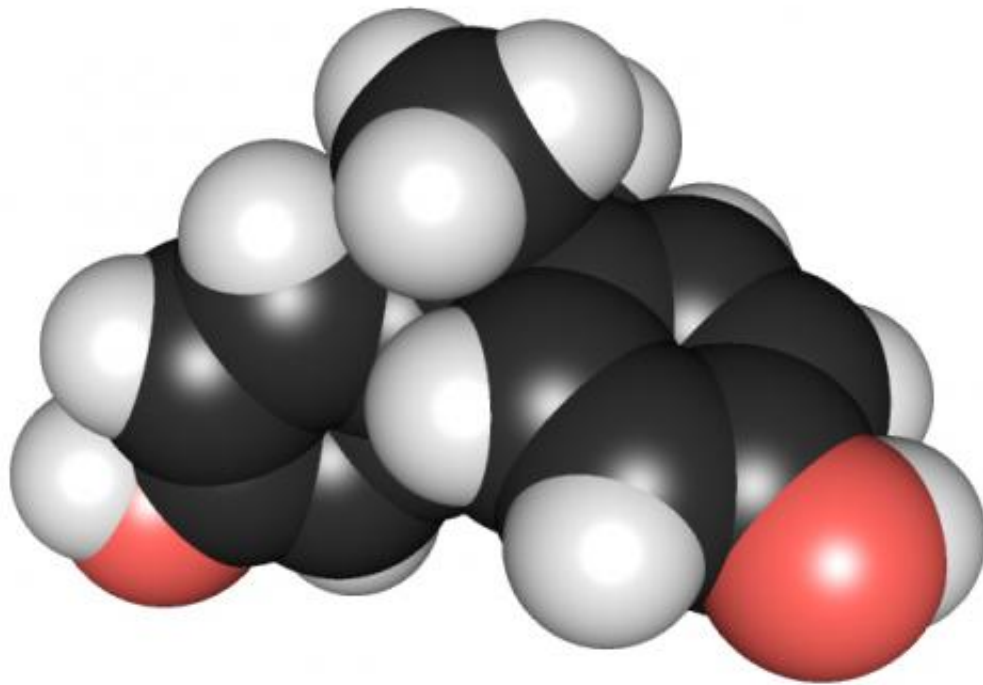


Exposure to low levels of BPA during pregnancy can lead to altered brain development

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3D chemical structure of bisphenol A. Credit: Edgar181 via Wikimedia Commons

New research in mice provides an explanation for how exposure to the widely used chemical bisphenol A (BPA) during pregnancy, even at

levels lower than the regulated "safe" human exposure level, can lead to altered brain development and behavior later in life. The research will be presented Monday, March 19 at ENDO 2018, the 100th annual meeting of the Endocrine Society in Chicago, Ill.

BPA is a [chemical](#) that is added to many commercial products, including water bottles, paper receipts, can liners and [food](#) storage containers. It is known as an endocrine-disrupting chemical—a chemical that interferes with the body's hormones.

"Decades of research in over 1,000 animal and 100 human epidemiological studies have demonstrated a link between BPA [exposure](#) and adverse health outcomes," said lead researcher Deborah Kurrasch, Ph.D., Associate Professor at the University of Calgary in Calgary, Canada. "This is especially true for the developing [brain](#), which is particularly sensitive to the estrogen-promoting effects of BPA during gestation. Indeed, several human studies have now correlated early life BPA exposure with behavioral problems later in childhood, suggesting BPA permanently alters brain development that leads to lasting effects on neural functioning."

Governmental agencies around the world, including the U.S. Food and Drug Administration, Health Canada, and European Food Safety Authority, declare BPA to be safe. "One reason for this disparity is the absence of a smoking gun: if BPA is so toxic to developing brains, then where is the evidence of defective brains?" Kurrasch said. "Our study is the first to use environmentally relevant doses of BPA and show exposure to the chemical during [brain development](#) can affect the timing of the birth of nerve cells, or neurons."

The researchers studied three groups of pregnant mice. One group ate food without BPA; a second group ate food with high doses of BPA; and a third ate low-dose BPA food. They found an increase in the number of

neurons created during early development in mouse pups exposed to high and low doses of BPA during pregnancy, compared with those not exposed to BPA.

"This is important because specific neurons are known to be born at a very distinct time points, and if they are born early—as is the case here—then presumably these early neurons will migrate to the wrong place and form the wrong connections. These findings start to provide a rationale as to how BPA might affect developing brains," Kurrasch said.

Siblings to these pups were given behavioral tests to assess whether the early birth of neurons led to changes that affected brain function later in life. The researchers found mice that were exposed to BPA-high and BPA-low food during gestation exhibited some behaviors that match those observed in human children whose mothers had high levels of BPA during pregnancy. "These findings suggest that gestational exposure to BPA can lead to lasting and permanent changes in the brain," Kurrasch said.

"The public is becoming well educated on the debate surrounding BPA safety, as well as other chemicals," she noted. "Although there is still work to be done to translate these rodent effects to human pregnancy, this research could provide expectant mothers with important information on what to avoid to best protect their babies."

Provided by The Endocrine Society

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