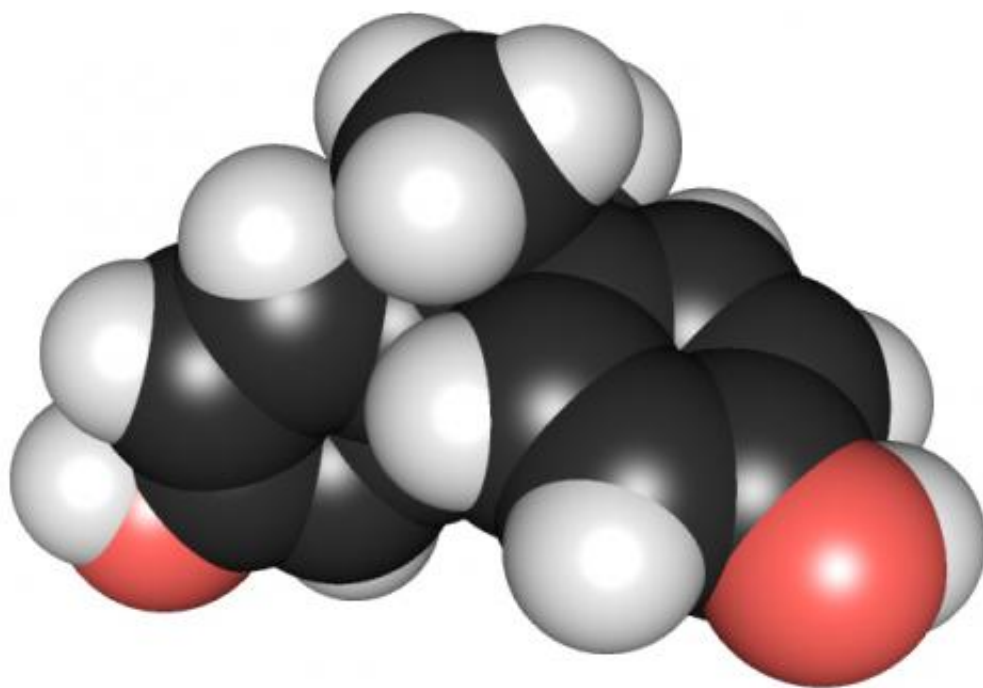


Liver tumors found in mice exposed to BPA

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

In one of the first studies to show a significant association between BPA and cancer development, University of Michigan School of Public Health researchers have found liver tumors in mice exposed to the chemical via their mothers during gestation and nursing.

"We found that 27 percent of the mice exposed to one of three different doses of BPA through their mother's diet developed [liver tumors](#) and some precancerous lesions. The higher the dosage, the more likely they were to present with tumors," said Caren Weinhouse, U-M doctoral student in the School of Public Health's Department of Environmental Health Sciences and first author of the paper published online Feb. 3 in *Environmental Health Perspectives*.

Mice whose mothers received the highest dosage, 50 mg of BPA per kg diet, were seven times more likely to have tumors than those whose mothers were not exposed to BPA.

The researchers said more research is needed to determine the implications for human health.

"This current study showing liver tumors in mice says let's take another look at BPA and cancer in humans," Weinhouse said, adding that next the lab will look for biomarkers in the mice genes that may signal risk for disease before it develops, and then try to see if similar characteristics are found in humans.

Bisphenol A, or BPA, is a chemical most commonly found in plastics, cash register receipts and the lining of food cans. It once was used in hard plastic bottles, including baby bottles, but many companies have removed it as concerns about health effects have been raised in recent years. Studies have estimated that at least 90 percent of Americans have some level of BPA in their bodies.

Previous research has found [precancerous lesions](#) associated with BPA exposure but the U-M study is the first statistically significant finding of clinically evident tumors in any organ, said Dana Dolinoy, the John G. Searle Assistant Professor of Environmental Health Sciences and senior/corresponding author of the study. Specifically, the researchers

found that adult offspring of exposed mothers had an increase in liver tumors.

Dolinoy said another interesting finding in their research is that tumor development didn't discriminate by sex.

"In general, females are at lower risk of spontaneous development of liver cancer," she said. "That distinction was erased in this study, with both males and females showing tumors."

The researchers fed 6-week-old female mice diets containing one of three environmentally relevant doses of BPA prior to mating, then throughout pregnancy and nursing. They then took one male and one female from each litter and followed them through to 10 months.

Another point of interest in their research, Dolinoy said, is that most other small animal studies have involved direct exposure to BPA. In this research, it was the mothers who were exposed before conception. The offspring, therefore, were exposed as developing fetuses and pups, not as adults.

"A previous study that exposed adult mice to much higher doses of BPA did not show the same link to [cancer development](#)," she said. "This tells us the timing of exposure and the dosage are extremely critical in evaluating study outcomes."

One year ago, Dolinoy's lab found BPA in human fetal liver tissue, demonstrating that there is considerable exposure to the chemical during pregnancy. In that study, they also found a proportionately higher concentration of free BPA—as opposed to conjugated forms modified by the body for elimination—showing that the ability to flush the chemical from the body is not the same in fetuses as in adults.

More information: Related study: medicalxpress.com/news/2013-01... sed-bpa-mothers.html

Human fetal liver study: medicalxpress.com/news/2012-12... re-fetal-livers.html

Provided by University of Michigan

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