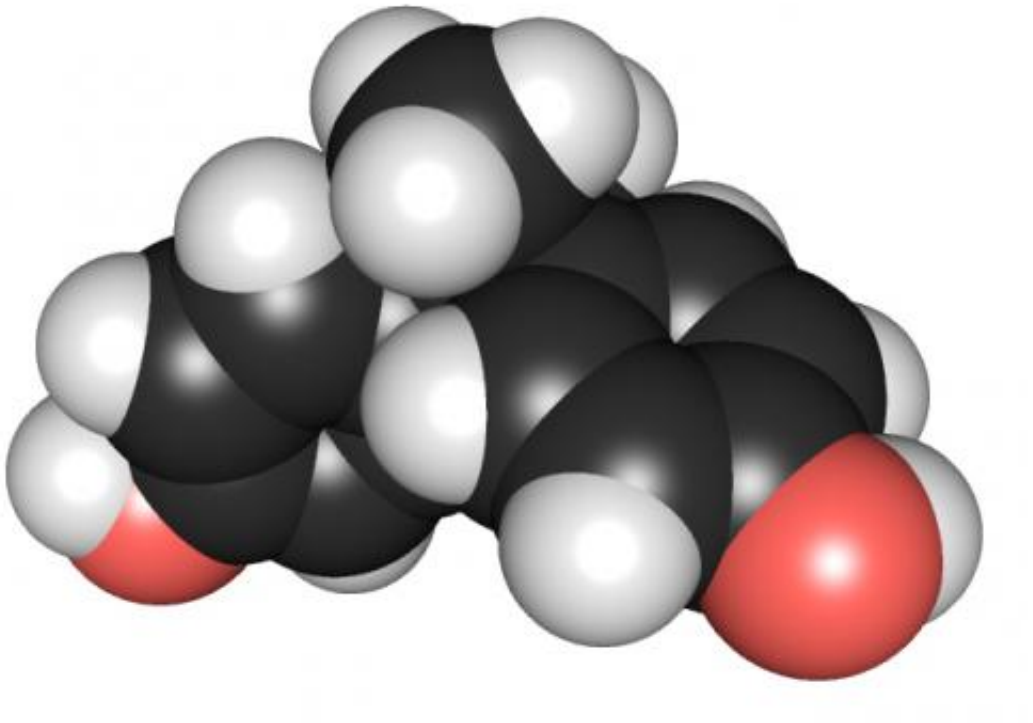
BPA stimulates growth of breast cancer cells, diminishes effect of treatment

June 23 2014



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

Bisphenol A (BPA), a chemical commonly used in plastics, appears to increase the proliferation of breast cancer cells, according to Duke Medicine researchers presenting at an annual meeting of endocrine scientists.

The researchers found that the chemical, at levels typically found in human blood, could also affect growth of an aggressive hormone-independent subtype of breast cancer cells called inflammatory breast cancer and diminish the effectiveness of treatments for the disease.

"We set out to determine whether routine exposures to common chemicals such as those in plastics, pesticides and insecticides could influence the effectiveness of breast cancer treatments," said corresponding author Gayathri Devi, Ph.D., associate professor of surgery at Duke. "BPA was one of the top chemicals to show growth stimulatory effects in breast cancer cells."

Devi and colleagues reported their findings in a featured abstract at the annual joint meeting of the International Society of Endocrinology and the Endocrine Society in Chicago, June 23, 2014.

Using new screening strategies, the researchers evaluated a panel of compounds available through a public library of chemicals managed by the Environmental Protection Agency.

The researchers focused on markers in breast cancer cells, specifically those of inflammatory breast cancer, a rare and aggressive form of disease that is difficult to treat.

Screenings identified several agents that appeared to increase the proliferation of inflammatory breast cancer cells. Among the most active was BPA, a chemical known to disrupt hormones. The researchers found that it caused breast cancer cells to grow at a faster rate in both estrogen-receptor positive and estrogen-receptor negative breast cancer cells.

The researchers also found that BPA doses in the range observed in human blood lowered the efficacy of FDA-approved anti-cancer drugs used in breast cancer therapy, notably lapatinib.

"These studies provide the foundation for additional research to develop tools that can be used to identify patients who may be at greater risk of developing treatment resistance," Devi said. "The findings could also lead to biomarkers that identify patients who have heavy exposure to compounds that could diminish the effectiveness of their cancer therapy."

Provided by Duke University Medical Center