BPA determined to have adverse effects on couples seeking in vitro fertilization

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Vom Saal says a new study has corroborated his work showing that BPA causes a linear increase in the death rate of embryos and could be the cause for decreases in the frequency of implantation, pregnancy and live birth rates in couples seeking in vitro fertilization. Credit: MU News Bureau

Bisphenol A (BPA) is an industrial chemical that is used in a variety of

consumer products, such as water bottles, metal food and beverage containers, and thermal paper cash register receipts. Long considered to have health effects on animals and humans, exposure to BPA may lead to reduced quality of embryos during reproduction. Fred vom Saal, a University of Missouri endocrinologist and researcher, has studied BPA and its effects on the reproductive system for more than 20 years. Now, a new study has corroborated his work showing that BPA causes a linear increase in the death rate of embryos and could be the cause for decreases in the frequency of implantation, pregnancy and live birth rates in couples seeking in vitro fertilization (IVF). Vom Saal, who wrote a review of the study, says that this is more proof that BPA usage should cease.

"The study, published by Jorge Chavarro at Harvard University, substantiates my lab's work on BPA and confirms a number of prior findings," said vom Saal, Curators' Professor of Biological Sciences in the College of Arts and Science at MU. "Dr. Chavarro and his team studied the effects of BPA on embryos in females undergoing in vitro fertilization and confirmed a number of prior findings. In science, when there are multiple, independent confirmations, then the scientific community accepts the findings, so this is a substantial turning point in the study of BPA and IVF."

BPA is one of the highest volume endocrine disrupting chemicals used in commerce, with current estimates determining that more than 7.7 million tons of the chemical being are produced each year. Additionally, since thousands of dollars can be spent during an IVF cycle and BPA has been proven to alter signaling mechanisms involving estrogen and other hormones required for successful IVF, it is likely that BPA is producing financial and emotional stress on couples seeking the procedure, vom Saal said.

"Previous studies have shown that BPA damages both sperm and eggs;

these results have been demonstrated in both animals and humans," vom Saal said. "The findings by Chavarro and colleagues show that the probability of having a surviving embryo goes from more than 50 percent to under 20 percent as levels of BPA increase. Nearly 20 years after my lab and others reported the first adverse reproductive effects in animals, BPA has finally begun to be identified as a reproductive toxicant by authorities. As findings continue to mount and confirm that daily exposure to BPA is a reproductive toxicant, it becomes vital to regulate and control this chemical."

Vom Saal recently presented his research at the Wisconsin Environmental Health Network Conference at the University of Wisconsin-Madison. His review, "Manmade and natural oestrogens: opposite effects on assisted reproduction," recently was published in *Nature Reviews Endocrinology*. Vom Saal is a fellow of the American Association for the Advancement of Science (AAAS) and has more than 200 peer-reviewed publications with more than 21,000 citations.

More information: Frederick S. vom Saal et al. Endocrine disruptors: Manmade and natural oestrogens: opposite effects on assisted reproduction, *Nature Reviews Endocrinology* (2016). DOI: 10.1038/nrendo.2016.38

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