

# BPA harms human reproduction by damaging chromosomes, disrupting egg development

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A Washington State University researcher has found new evidence that the plastic additive BPA can disrupt women's reproductive systems, causing chromosome damage, miscarriages and birth defects.

Writing in the journal [Proceedings of the National Academy of Sciences](#), WSU geneticist Patricia Hunt and colleagues at WSU and the University of California, Davis, report seeing reproductive abnormalities in [rhesus monkeys](#) with BPA levels similar to those of humans. By using an animal with the most human-like reproductive system, the research bolsters earlier work by Hunt and others documenting widespread reproductive effects in rodents.

"The concern is exposure to this chemical that we're all exposed to could increase the risk of miscarriages and the risk of babies born with birth defects like Down Syndrome," says Hunt. "The really stunning thing about the effect is we're dosing grandma, it's crossing the placenta and hitting her developing fetus, and if that fetus is a female, it's changing the likelihood that that female is going to ovulate normal eggs. It's a three-for-one hit."

The research also adds to the number of organs affected by BPA, or [bisphenol A](#), which is found in plastic bottles, the linings of aluminum cans and heat-activated cash register receipts. This May, Hunt was part of another paper in *PNAS* reporting that the additive altered mammary

development in the primate, increasing the risk of cancer.

Hunt's colleagues at UC, Davis exposed different groups of gestating monkeys to single daily doses of BPA and low-level continuous doses and looked at how they affected the reproductive systems of female fetuses. She saw that in the earliest stage of the adult's [egg development](#), the [egg cell](#) failed to divide properly. Earlier mouse studies showed similar disturbances translated into [genetic defects](#) in the mature egg.

A fertilized egg with the wrong number of chromosomes will almost always fail to come to term, leading to a [spontaneous abortion](#) or progeny with birth defects.

In monkeys exposed continuously, Hunt saw further complications in the third trimester as fetal eggs were not packaged appropriately in follicles, structures in which they develop. Eggs need to be packaged properly to grow, develop and mature.

"That's not good," says Hunt, "because it looks to us like you're just throwing away a huge number of the eggs that a female would have. It raises concerns about whether or not she's going to have a really short reproductive lifespan."

**More information:** Bisphenol A alters early oogenesis and follicle formation in the fetal ovary of the rhesus monkey, [www.pnas.org/cgi/doi/10.1073/pnas.1207854109](http://www.pnas.org/cgi/doi/10.1073/pnas.1207854109)

Provided by Washington State University

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