

## THE EGG AND THE ENVIRONMENT

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The effect of environmental exposures on human fertility is an area of growing concern. Recent studies by us and by others suggest that exposure to the estrogenic chemical, bisphenol A (BPA) can profoundly impact oogenesis. Specifically, exposures during fetal development have been reported to adversely affect early meiotic events and the packaging of oocytes into follicles, and exposures during oocyte growth in the adult female have been reported to disturb meiotic chromosome behavior. Disturbances during these important windows of oocyte developmental have the potential to alter the reproductive lifespan of the female and the genetic quality of the eggs she produces. To understand the mechanisms by which estrogenic chemicals exert these effects and to assess the potential effects in humans, we are conducting studies in mice, humans, and nonhuman primates.

BPA is present in wide variety of food and beverage containers and, although humans are exposed to BPA on a daily basis, low doses have been considered safe because the chemical is thought to be rapidly metabolized and eliminated. Nevertheless, studies in rodents suggest that low dose BPA exposure during pregnancy has the potential to disrupt the development of the reproductive tract, breast, prostate, and brain. Current studies in our laboratory are focused on understanding the molecular mechanisms by which BPA affects the developing ovary and the impact of these disturbances on the reproductive potential of adult females exposed *in utero*. To relate BPA effects seen in the mouse to humans, we are conducting studies of human fetal oocytes to determine if meiotic disturbances are correlated with levels of BPA in maternal serum and amniotic fluid. In addition, we are using the rhesus monkey to assess the impact of known doses of BPA on the primate ovary. Lastly, because rhesus provides a good model for human metabolism of chemicals like BPA, we are conducting studies to determine if BPA metabolism differs in the nonpregnant and pregnant female. Using deuterated BPA to monitor levels of BPA in the serum during the 24-hour period following ingestion, we have been able to confirm that BPA is rapidly metabolized in the nonpregnant female and does not bioaccumulate. However, doses of BPA eight times higher than the currently estimated "safe" human dose yield mean serum BPA levels during the 24 hours after administration that are far below those reported in humans. These results raise new concerns because they suggest that current human exposure levels are far higher than previously thought.

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