

## 6 environmental research studies reveal critical health risks from plastic

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Exposure to Bisphenol A (BPA), phthalates and flame retardants (PBDEs) are strongly associated with adverse health effects on humans and laboratory animals. A special section in the October 2008 issue of *Environmental Research*, "A Plastic World" provides critical new research on environmental contaminants and adverse reproductive and behavioral effects.

Plastic products contain "endocrine disrupting chemicals" that can block the production of the male sex hormone testosterone (phthalates used in PVC plastic), mimic the action of the sex hormone estrogen (bisphenol A or BPA used in polycarbonate plastic), and interfere with thyroid hormone (brominated flame retardants or PBDEs used in many types of plastic).

Two articles report very similar changes in male reproductive organs in rats and humans related to fetal exposure to phthalates. Two articles show that fetal exposure to BPA or PBDEs disrupts normal development of the brain and behavior in rats and mice. Two other articles provide data that these chemicals are massively contaminating the oceans and causing harm to aquatic wildlife.

The other studies integrate new laboratory research with a broader view reflecting exposures to a variety of chemicals in plastic. These ubiquitous chemicals found in many plastics act independently and together to adversely affect human, animal and environmental health.

The articles show amongst others the massive contamination of the Pacific Ocean with plastic, and the amount of contamination has increased dramatically in recent years; animal brain structure, brain chemistry and behavioral effects from exposure to BPA and "phthalate syndrome" in rats' male offspring.

"For the first time a series of articles will appear together that identify that billions of kilograms of a number of chemicals used in the manufacture of different types of plastic can leach out of plastic products and cause harm to the brain and reproductive system when exposure occurs during fetal life or prior to weaning," emphasized Dr. Frederick vom Saal, Guest Editor of the "Plastic World".

"Not only are these studies of scientific importance, they also contribute to the ongoing US congressional hearings involving the Food and Drug Administration," remarked Gert-Jan Geraeds, Publisher of Environmental Research, "As such, "The Plastic World" has a broader societal impact and raises awareness of increasingly important environmental issues".

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