

Current chemical testing missing low-dosage effects of endocrine-disrupting chemicals

March 29 2012

Endocrine-disrupting chemicals (EDCs) -- such as BPA -- can show tangible effects on health endpoints at high dosage levels, yet those effects do not predict how EDCs will affect the endocrine system at low doses, according to a recent study accepted for publication in The Endocrine Society's *Endocrine Reviews*. Study authors say current definitions of low-dosage as used by the U.S. Environmental Protection Agency (EPA) do not fully take into account the unique influence that low doses of EDCs have on disease development in humans.

Endocrine-disrupting chemicals are substances in the environment that interfere with hormone biosynthesis, metabolism or action resulting in adverse developmental, reproductive, neurological and immune effects in both humans and wildlife. The current report found that low doses of EDCs, which are comparable to the average person's [environmental exposure](#) to these chemicals, can result in significant health effects.

"Whether low doses of EDCs influence disorders in humans is no longer conjecture as epidemiological studies show that environmental exposures to EDCs are associated with human diseases and disabilities," said Laura Vandenberg of Tufts University in Medford, Mass. and lead author of the study. "Current testing paradigms are missing important, sensitive endpoints and fundamental changes in [chemical](#) testing and safety determination are needed to protect human health."

In this study, researchers reviewed the current EDC literature and explored the relationships between dose and effect. They found that this

relationship could be non-linear; meaning that EDCs effect on the body varied within the range of doses examined. The report provides a detailed discussion on the mechanisms responsible for generating this phenomenon, plus hundreds of examples from the cell culture, animal and epidemiology literature.

"Low-dose effects are remarkably common in studies of natural hormones and EDCs," said Vandenberg. "We recommend greatly expanded and generalized safety testing and surveillance to detect potential adverse effects of this broad class of chemicals. Before new chemicals are developed, a wider range of doses, extending into the low-dose range, should be fully tested."

More information: The article, "Hormones and Endocrine-Disrupting Chemicals: Low-Dose Effects and Nonmonotonic Dose Responses," appears in the June 2012 issue of *Endocrine Reviews*.

Provided by The Endocrine Society

Citation: Current chemical testing missing low-dosage effects of endocrine-disrupting chemicals (2012, March 29) retrieved 21 May 2023 from <https://medicalxpress.com/news/2012-03-current-chemical-low-dosage-effects-endocrine-disrupting.html>

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