

Endocrine Disrupters: A Scientific Perspective

By ACSH Staff — July 1, 1999

For years researchers have been investigating the hypothesis that trace levels of such industrial chemicals as pesticides, chlorinated compounds, and heavy metals are hazardous to human health.

Although studies have failed to establish a causal relationship, some scientists and activist groups continue to emphasize the role of trace levels of synthetic chemicals in human illness.

This continuing focus may be attributed, in part, to our increased ability to detect low levels of chemicals in the environment. It may also stem, however, from a collective - and often irrational - fear of such substances. In this report the American Council on Science and Health (ACSH) explores the endocrine disrupter hypothesis, which asserts that certain (primarily man-made) chemicals act as, or interfere with, human hormones (specifically estrogens) in the body and thus cause a range of defects and diseases related to the endocrine system.

This report also evaluates the possible implications of endocrine disrupters, more appropriately called "endocrine modulators", for human health. The following points are central to ACSH's analysis:

- High doses of some environmental contaminants have produced toxic effects in certain wildlife species. In some instances the effects appear to involve the endocrine system. Humans, however, have comparatively much lower exposures to these suspected endocrine modulators. This fact is crucial to assessing the potential risks, if any, associated with these substances.
- To date no consistent, convincing association has been made between exposures to synthetic chemicals in the environment and increased cancer in hormonally sensitive human tissues (breast and prostate tissues, for example). While a chemical may cause cancer in certain laboratory animals when given at high doses, it does not necessarily cause cancer in humans—who, as indicated above, have much lower exposures to synthetic environmental chemicals.
- Humans are exposed through their diet to estrogenic substances (substances having an effect similar to that of the human hormone estrogen) found in many plants. Dietary exposures to these plant estrogens (phytoestrogens) are presumably greater than are exposures to suspected synthetic endocrine modulators. No adverse health effects have been associated with the overwhelming majority of these dietary exposures.
- There currently is a trend in most environmental sectors (i.e. air, water, and soil) toward decreasing concentrations of many environmental contaminants, including several that are suspected of being endocrine disrupters.
- Some of the key research findings that propelled the endocrine disrupter hypothesis have

been retracted, are not reproducible, or have not been reproduced.

- The available human epidemiological data do not show any consistent, convincing evidence of increases in detrimental health effects related to industrial chemicals suspected of disrupting the endocrine system.

When examining the endocrine disrupter hypothesis, as with any other hypothesis, it is important to validate studies and novel findings before the media and others publicize them prematurely, exaggerate the evidence, and create undue alarm. Unfortunately, once irrational fears have been aroused, it becomes difficult to distinguish real risk from hypothetical risk.

The lack of quick results and definite answers can be frustrating, both to the public and to policymakers, who are often pressured by their constituents to impose the "precautionary principle": Act now and confirm the truth later. But we must proceed objectively, using sound scientific principles—or we will find ourselves misdirecting valuable public resources, both intellectual and financial.

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ACSH accepts unrestricted grants on the condition that it is solely responsible for the conduct of its research and the dissemination of its work to the public. The organization does not perform proprietary research, nor does it accept support from individual corporations for specific research projects. All contributions to ACSH—a publicly funded organization under Section 501(c)(3) of the Internal Revenue Code—are tax deductible.

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