

## **Endocrinology and Environmental Estrogens**

The Endocrine Society

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1-888-ENDOCRINE, [www.endo-society.org](http://www.endo-society.org)

### What are environmental estrogens?

Environmental estrogens are chemicals found around us that act like the female sex hormone, estrogen (estradiol). Estrogenic chemicals may occur normally in nature and may be found in plants and in one's diet. Others are synthetic, or "man-made" and may be found in plastics or insecticides such as PCB's, DDT, dioxins, and furans. Another example of a man-made chemical that mimics estrogen is diethylstilbestrol (DES) which has been used in the past to prevent miscarriage and to promote growth in livestock and poultry.

### Why are they an important issue?

It is important to understand the effects of these compounds because they may persist in the body for prolonged periods of time. Hormones are the chemical messengers of the body's endocrine system. Environmental chemicals may alter the function of the endocrine system by mimicking hormone actions and either triggering or blocking a response to the body's natural hormones.

The body's natural hormonal balance is necessary to maintain normal body activity. Estrogen and other hormones cause their effects by binding to receptor molecules in cell tissues like the breast, uterus, prostate, brain, and skin. Then, the receptor acts as the translator of the hormone, in this case estrogen, in the cell.

When synthetic compounds function as hormonal "mimics", they also bind to the receptor. Some foreign chemicals interact with the estrogen

receptor and produce estrogen-like effects on the development of the brain, male and female reproductive organs, and breasts, causing a variety of disorders, including: overgrowth of the vaginal lining, premature breast development, feminization of male offspring, and infertility.

### What is the role of endocrinology?

Much more information is needed to understand the adverse effects of these compounds. Endocrinology is the scientific discipline that studies hormones and the endocrine system. Basic endocrine research is advancing our understanding of these compounds and how they can affect human health.

An important area of endocrine research is the effect of the lower levels of these substances that occur in our daily life, especially in children and the elderly. Exposure to estrogen during the sexual development has been associated with feminization of the male reproductive system in animals, and estrogens contained in plants can decrease reproduction in the wild and domestic animals that eat them.

These are significant studies, because the disorders associated with developmental exposure to potent estrogens provide clues to the human health effects that may be associated with much weaker environmental estrogens.

Basic and clinical endocrine research continues to examine environmental factors and mechanisms for a wide range of conditions that affect the human endocrine system, including aging, cancer, AIDS, infertility, asthma, and birth defects. Further endocrine research is needed to evaluate the possible public health effects of known environmental estrogens and the potential estrogenic activities of other chemicals.

(Revised 2000)

### The Endocrine Society

The Endocrine Society is the world's largest and most active organization devoted to the research, study and clinical practice of endocrinology.

Over 9,000 scientists, educators, clinicians, practicing MDs, nurses and students, from over 78 countries make up the organization's membership and represent all basic, applied and clinical interests in endocrinology.

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### The Hormone Foundation

The Hormone Foundation, the public education and outreach affiliate of The Endocrine Society, is an independent, non-profit organization, that seeks to improve the quality of life by promoting the prevention, diagnosis, and treatment of human disease in which hormones play a role. Founded in 1997 by The Endocrine Society, the Foundation strives to educate the public by publishing materials and holding educational forums, seminars, lectures and meetings.

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