

**Table 1: Examples of endocrine-disrupting chemicals**

Chemical	Use	Mechanism	Health effect	References
DES	Synthetic estrogen	Estrogen receptor agonist	Humans (prenatal exposure): vaginal cancer, reproductive tract abnormalities (females); cryptorchidism, hypospadias, semen abnormalities (males)	4
Methoxychlor	Insecticide	Metabolite is an estrogen receptor agonist	Rodents: accelerated puberty, abnormal ovarian cycling (females); aggressive behaviour (males)	7,13
DDT	Insecticide	Metabolite (DDE) is an androgen receptor antagonist	Rodents (males): delayed puberty, reduced sex accessory gland size, altered sex differentiation	14
Vinclozolin	Fungicide	Androgen receptor antagonist	Rodents (males): feminization, nipple development, hypospadias	15
PCBs	No longer manufactured; still in electrical transformers, capacitors, toxic waste sites, food chain	Accelerated T <sub>4</sub> metabolism, decreased T <sub>4</sub> levels, elevated TSH levels (high doses: thyromimetic)	Humans (in utero exposure): delayed neurological development; IQ deficits	16,17
Atrazine	Herbicide	Reduces gonadotropin-releasing hormone from hypothalamus, reduces pituitary LH levels, interferes with metabolism of estradiol, blocks estrogen receptor binding	Rodents (females): mammary tumours, abnormal ovarian cycling Humans: some evidence of breast and ovarian tumours	18–22
Dioxin	By-product of industrial processes including waste incineration; food contaminant	Aryl hydrocarbon receptor agonist; increases estrogen metabolism, decreases estrogen-mediated gene transcription, decreases estrogen levels, decreases testosterone levels by interfering with HPG axis	Rodents (in utero exposure): delayed puberty, increased susceptibility to mammary cancer (females); decreased testosterone, hypospadias, hypospermia, delayed testicular descent, feminized sexual behaviour (males) Humans: decreased T <sub>3</sub> and T <sub>4</sub> levels, decreased testosterone levels,* cancer*	23–27

Note: DES = diethylstilbestrol, DDT = dichlorodiphenyltrichloroethane, PCBs = polychlorinated biphenyls, T<sub>4</sub> = thyroxine, TSH = thyroid stimulating hormone, IQ = intelligence quotient, LH = luteinizing hormone, HPG axis = hypothalamic-pituitary-gonadal axis, T<sub>3</sub> = triiodothyronine.  
\*Exposures in adults.

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