



Microconstituents Glossary

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agonistic effect Endocrine disruption can be either agonist or antagonist. If chemicals bind to a hormone receptor and activate a response, such as hormone mimic, then it is termed an agonistic effect.

androgen Any of the male hormones, including testosterone and androsterone.

androgen antagonists Any group of chemicals capable of inhibiting or preventing the biological effects of androgens.

antagonistic effect Endocrine disruption can be either agonist or antagonist. If chemicals bind to a hormone receptor but no response is produced, this prevents the natural hormone from interacting (hormone blocking) and is termed an antagonistic effect.

antibiotic resistance The ability of certain microorganisms to grow or thrive in the presence of antimicrobial substances as a result of natural selection or acquisition of genetic material from other organisms.

bioaccumulation A phenomenon characterized by the accumulation of a substance within a living organism through feeding activities or various environmental sources.

bioaccumulative chemicals of concern (BCCs) Any chemical (or compound) that has the potential to bioaccumulate within plants, fish, or other organisms, potentially causing adverse effects.

bioavailability The degree to which a compound is absorbed and made available within an organism over a range of concentrations. Bioavailability depends on the chemical structure and properties of the compound, route of exposure, and the life form of interest.

bioconcentration The phenomenon in which the concentration of a substance within specific tissue(s) of a living organism exceeds that of the environmental matrix in which the organism is found.

bioconcentrative chemical (or compound) See *bioaccumulative chemicals of concern (BCCs)*.

biomagnification The phenomenon by which the concentration of a substance in organisms' tissues increases in parallel with the organisms' trophic levels. A biomagnified chemical or compound is analogous to a bioaccumulative chemical or compound. See also *bioaccumulative chemicals of concern (BCCs)*.

biomarker A molecular indicator associated with a biological function.

bioremediation Any use of bacteria or other microbes to degrade a compound that is harmful into a compound or series of compounds that are less harmful or are easily disposed. Generally involves adding nutrients or otherwise altering site conditions to speed up the natural process of biodegradation.

biotransformation The transformation/alteration of one chemical to another using living organisms or enzymes.

brominated flame retardants (BFRs) A group of brominated organic substances that have an inhibitory effect on the ignition of combustible organic materials. Brominated flame retardants are commonly used in electronic products, clothes, and furniture and are currently the largest market group of flame retardants because of their low cost and high performance efficiency. Most BFRs are considered persistent organic pollutants, known to bioaccumulate.

endocrine active compounds (EACs) Substances that interfere with the production, release, transport, metabolism, binding, action, or elimination of an organism's hormones, affecting normal life functions such as maintenance of homeostasis and regulation of the developmental process. These compounds tend to mimic endogenous hormones and/or interfere with hormone pharmacokinetics.

endocrine disruption When substances interact with hormone receptors and alter the natural response patterns of the endocrine system.

endocrine disruptors Substances that cause adverse biological effects by interfering with the endocrine system. See also *endocrine disrupting chemicals (EDCs)*.

endocrine disrupting chemicals (or compounds) (EDCs) Substances that interfere with the production, release, transport, metabolism, binding, action, or elimination of natural hormones in the body responsible for the maintenance of homeostasis and the regulation of reproduction, development, or behavioral processes. Based on the mechanism of action, endocrine disruptors can be categorized as mimics, stimulators, blockers, endocrine flushers, enzyme flushers, or destructors.

endocrine modulator A substance that modifies the endocrine system. See also *endocrine disrupters* and *hormonally active chemicals (HACs)*.

endocrine system A network of glands distributed throughout the body. These glands produce hormones that are distributed to distant target sites via blood. Hormones produced by these glands act as chemical messengers to control body functions such as growth, metabolism, sexual development, and egg and sperm production.

endocrine toxicant A substance that alters function(s) of the endocrine system and consequently causes adverse health effects in an intact organism or its progeny.

estrogen A steroid sex hormone regulating the female reproductive processes and creating feminine secondary sexual characteristics: estradiol—an estrogenic hormone ($C_{18}H_{24}O_2$) produced by the ovaries and used in treating estrogen deficiency; estriol—an estrogenic hormone ($C_{18}H_{24}O_3$) that is a metabolite of estradiol found in the urine of pregnant women; and estrone—an estrogenic hormone ($C_{18}H_{22}O_2$) that is a metabolite of 17 β -estradiol.

estrogen antagonists Also known as anti-estrogens, any group of chemicals capable of inhibiting or preventing the biological effects of estrogens.

feral pharmaceuticals Over-the-counter and prescription drugs that are found in natural environments.

hormonally active chemicals (HACs) A term for endocrine disrupters preferred by some because it neither addresses nor evaluates the chemical's mechanism of action. See also *endocrine disrupters* and *endocrine modulator*.

hormonally active agents A wide variety of chemicals that mimic the actions of hormones and are associated with adverse reproductive and developmental effects in wildlife. See also *endocrine disruptors* and *hormonally active chemicals (HACs)*.

hormone disruptors Substances that cause adverse biological effects by disrupting the physiological function of hormones.

in vitro assay A test conducted with cells or tissue extracted from an organism. May be used for high-throughput screening of a large number of compounds for potential endocrine disrupting effects but is unable to indicate the endocrine disrupting end point effect to the whole organism and/or life-cycle changes in sensitivity of organs to exposure to EDCs. The most often used in vitro assays include competitive ligand binding assay, cell proliferation techniques, and recombinant receptor–reporter assays.

in vivo assays A test conducted on living organisms. May be used to evaluate the effects of an endocrine disrupting compound on the endocrine system as a whole. This type of assay has been proposed to be the ultimate test for identifying adverse effects in endocrine systems. The most commonly used in vivo assay is the rodent uterotrophic assay, which is based on the ability of chemicals to stimulate uterine growth in female rats.

microconstituents Natural and manmade substances, including elements and inorganic and organic chemicals, detected within water and the environment, for which a prudent course of action is suggested for the continued assessment of the potential effect on human health and the environment.

nutraceuticals Any substance that may be considered a food or part of a food and provides medicinal or health benefits, including the prevention and treatment of disease. Nutraceuticals are different from supplements, which supply missing nutrients. Examples of nutraceuticals include folic acid (to prevent birth defects), pectin (to lower cholesterol), and fiber (to reduce the risk of colon cancer). The term is derived from nutrition and pharmaceuticals. Alternate spelling: *nutriceutical*.

organic wastewater contaminants (OWCs) Carbon-based substances associated with domestic, industrial, and/or agricultural wastewaters. Organic wastewater contaminants include antibiotics, other prescription drugs, nonprescription drugs, steroids, reproductive hormones, personal care products, products of oil use and combustion, and other extensively used chemicals.

persistent bioaccumulative toxics or persistent bioaccumulative toxic pollutants (PBTs)

Harmful chemicals that remain in the environment for long periods because of their resistance to environmental degradation through chemical, biological, and photolytic processes. Persistent bioaccumulative toxics may bioaccumulate in food chains, posing risks to human health and ecosystems. These chemicals transfer easily among air, water, and land and span boundaries of geography and generations.

persistent organic pollutants (POPs) Organic compounds that remain intact in the environment for long periods, are capable of long-range transport, or bioaccumulate in human and animal tissue. Persistent organic pollutants have potentially significant effects on human health and the environment. Typical chemical characteristics of these compounds include low water solubility, low volatility, high lipid solubility, and high molecular masses, which together confer the ability to accumulate in the organism's fatty tissues.

personal care products (PCPs) A category of substances that are consumed by individuals for personal health or cosmetic reasons exclusive of pharmaceuticals.

personal care product ingredients (PCPIs) A category of chemicals that includes non-therapeutic pharmaceuticals (e.g., diagnostic agents or X-ray contrast media) and personal care items (e.g., fragrances and shampoos). Personal care product ingredients are analogous to pharmaceutically active compounds (PhACs) in that the term refers specifically to the “active” ingredients in personal care products. See also *pharmaceutically active compounds (PhACs)*.

pharmaceutical and personal care products (PPCPs) Refers to any products consumed by individuals for personal health or cosmetic reasons. A diverse collection of chemical substances, including prescription and over-the-counter therapeutic drugs, fragrances, cosmetics, sun-screen agents, diagnostic agents, nutraceuticals, biopharmaceuticals, and many others.

pharmaceutically active compounds (PhACs) A category of compounds encompassing therapeutically active drugs. Does not include non-therapeutic pharmaceuticals (e.g., diagnostic agents such as X-ray contrast media) or personal care products such as fragrances.

pharmaceutical, personal care, and food products (PPCFPs) A term that expands pharmaceutical and personal care products further to include genetically modified foods.

pharmaceuticals Medical drugs that are prepared or dispensed in pharmacies and used in medical treatment.

plant-made pharmaceuticals (PMPs) A subsector of the biotechnology industry that involves the process of genetically engineering plants that can produce certain types of proteins. The proteins can then be harvested and used to produce pharmaceuticals.

toxicokinetics The application of pharmacokinetics to determine the toxicity of the systemic exposure of a compound in experimental animals. Toxicokinetics examine the process of the uptake of potentially toxic substances by the body, biotransformation of the substances, distribution of the substances and their metabolites in the tissues, and elimination of the substances and their metabolites from the body.

uncoupler A compound that uncouples respiration growth in biological organisms (e.g., herbicides and pesticides).

xenobiotic Chemical substances foreign to a biological system because they are not normally produced or expected to be present. They include naturally occurring compounds, pharmaceuticals, environmental agents, and petrochemicals.

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