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CLASSIFICATION OF THE STRUCTURE OF THE ONCOGENNIE VIRUS , WAYS OF TRANSMISSION TO ORAGNISM , ITS EFFECT ON THE ENDOCRINE SYSTEM , ANTIGENICITY DISORDERS

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Annotation: An oncovirus or oncogenic virus is a virus that can cause cancer. This term originated from studies of acutely transforming retroviruses in the 1950–60s, when the term "oncornaviruses" was used to denote their RNA virus origin. With the letters "RNA" removed, it now refers to any virus with a DNA or RNA genome causing cancer and is synonymous with "tumor virus" or "cancer virus". The vast majority of human and animal viruses do not cause cancer, probably because of longstanding coevolution between the virus and its host. Oncoviruses have been important not only in epidemiology, but also in investigations of cell cycle control mechanisms such as the retinoblastoma protein. **Carcinogen**, any of a number of agents that can cause cancer in humans. They can be divided into three major categories: chemical carcinogens (including those from biological sources), physical carcinogens, and oncogenic(cancer-causing) viruses.
Key words: carcinogen, World Health Organization, tumor, dolor, polycyclic aromatic hydrocarbons.

Most carcinogens, singly or in combination, produce cancer by interacting with DNA in cells and thereby interfering with normal cellular function. This ultimately results in the formation of a tumour (an abnormal tissue growth) that has the ability to spread (metastasize) from its site of origin and invade and cause dysfunction of other tissues, culminating in organ failure and death. The two primary mechanisms by which carcinogens initiate the formation of such tumours is via alterations in DNA that encourage cell division and that prevent cells from being able to self-destruct when stimulated by normal triggers, such as DNA damage or cellular injury (a process known as apoptosis). There also exist carcinogens that induce cancer through nongenotoxic mechanisms, such as immunosuppression and induction of tissue-specific inflammation.

More than 400 chemical agents have been listed as carcinogenic, probably carcinogenic, or possibly carcinogenic by the International Agency for Research on Cancer (IARC), a branch of the World Health Organization that monitors cancer occurrence worldwide and performs epidemiological and laboratory investigations to understand the causes of cancer. Among the carcinogenic substances listed by IARC are a variety of chemical effluents from industry and environmental pollutants from automobiles, residences, and factories. One such example is acrylamide, which is considered a probable carcinogen in humans and is produced as a result of industrial processes and cooking certain foods at high temperatures. It can be released into the environment through its application in wastewater treatment and its use in grout and soil-stabilizer products. Other examples of chemical carcinogens include nitrosamines and polycyclic aromatic hydrocarbons, which are found in tobacco smoke and are associated with the development of lung cancer. Physical carcinogens include ultraviolet rays

from sunlight and ionizing radiation from X-rays and from radioactive materials in industry and in the general environment. Repeated local injury (e.g., wounding) or recurring irritation (e.g., chronic inflammation) to a part of the body are other examples of potential physical carcinogens.

A number of viruses are suspected of causing cancer in animals, including humans, and are frequently referred to as oncogenic viruses. Examples include human papillomaviruses, the Epstein-Barr virus, and the hepatitis B virus, all of which have genomes made up of DNA. Human T-cell leukemia virus type I (HTLV-I), which is a retrovirus (a type of RNA virus), is linked to tumour formation in humans.

Some—not all—cancers are heritable in the sense that a predisposition exists, awaiting a convergence of carcinogenic influences for cancer to manifest itself. The identification and timely elimination of carcinogens can reduce the incidence of cancer.
Antigen, substance that is capable of stimulating an immune response, specifically activating lymphocytes, which are the body's infection-fighting white blood cells. In general, two main divisions of antigens are recognized: foreign antigens (or heteroantigens) and autoantigens (or self-antigens). Foreign antigens originate from outside the body. Examples include parts of or substances produced by viruses or microorganisms (such as bacteria and protozoa), as well as substances in snake venom, certain proteins in foods, and components of serum and red blood cells from other individuals. Autoantigens, on the other hand, originate within the body. Normally, the body is able to distinguish self from nonself, but in persons with autoimmune disorders, normal bodily substances provoke an immune response, leading to the generation of autoantibodies. An antigen that induces an immune response—i.e., stimulates the lymphocytes to produce antibody or to attack the antigen directly—is called an immunogen.

On the surface of antigens are regions, called antigenic determinants, that fit and bind to receptor molecules of complementary structure on the surface of the lymphocytes. The binding of the lymphocytes' receptors to the antigens' surface molecules stimulates the lymphocytes to multiply and to initiate an immune response—including the production of antibody, the activation of cytotoxic cells, or both—against the antigen. The amount of antibody formed in response to stimulation depends on the kind and amount of antigen involved, the route of entry to the body, and individual characteristics of the host.
Endocrine disruptor, also called endocrine modulator, endocrine-disrupting chemical, or endocrine active compound, any chemical that mimics or interferes with the normal actions of hormones in the body. Endocrine disruptors may be synthetic or natural (e.g., phytoestrogens) in origin and are used in a wide range of products and materials, from cosmetics and plastics to pesticides and industrial solvents. Because hormones are the chemical messengers of the endocrine system—the network of glands that regulates all essential biological processes, including development, metabolism, and reproduction—exposure to endocrine disruptors is a major health issue and an environmental concern in countries worldwide.
Early discoveries of endocrine disruptors

The ability of certain chemicals to interfere with endocrine function was realized in the mid-20th century, and synthetic pesticides were among the first to be studied. The most well-known of those pesticides was DDT (dichlorodiphenyltrichloroethane). In the 1960s DDT was found

to accumulate in body tissues and to be harmful especially to birds, in which it caused eggshell thinning that resulted in reduced egg viability and fewer hatchlings. Exposure to the chemical led to the decline of many bird species, including the bald eagle, golden eagle, and brown pelican, and affected the reproduction of some mammalian species, including sea lions, which delivered pups prematurely. The following decade, diethylstilbestrol (DES), a nonsteroidal synthetic estrogen drug, was discovered to cause reproductive tract defects and an otherwise rare reproductive cancer in daughters born to women who had taken the drug while pregnant. DES was known to mimic the actions of estrogen, but it was widely believed that chemicals could not cross the placental barrier, and, hence, its effects on female offspring had not been anticipated.

By the early 1970s some countries had begun to restrict the use of both DDT and DES. Subsequent research showed that DDT and a number of other chemicals and their metabolites possessed an affinity for hormone receptors and, through their actions at the receptors, whether mimicking natural hormones or blocking receptor activity, effectively disrupted or otherwise altered endocrine function in animals. That realization led, in the early 1990s, to the introduction of the term *endocrine disruptor*.

Endocrine-disrupting chemicals and their sources

Since the 1960s and ’70s, large numbers of endocrine-disrupting chemicals have been identified, and many of them are widely distributed in the environment. Although a number of them are herbicides, fungicides, or insecticides, a variety of industrial chemicals and some naturally occurring elements have also been discovered to be toxic to the endocrine system. Examples include bisphenol A (BPA), dioxin, lead, mercury, polychlorinated biphenyls (PCBs), and styrenes. Many personal care products, including lotions, perfumes, and shampoos, contain glycol ethers, parabens, and phthalates—chemicals that have been shown to interfere with the function of hormonal pathways in the body. Chemicals such as BPA and phthalates are commonly used as plasticizers and can be found in everyday household items, including plastic food containers, raincoats, and shower curtains. Polybrominated diphenyl ethers (PBDEs), which are synthetic halogenated compounds, are used as flame retardants in a variety of products, including electronics, foams, plastics, and textiles.

Routes of exposure to endocrine disruptors

Exposure to endocrine-disrupting chemicals can occur in various ways. Dioxins, PCBs, and synthetic pesticides that are released into the environment leach into soil and groundwater, potentially contaminating supplies of drinking water. BPA and phthalates tend to leach from plastic containers into the beverages or food they hold. Thus, some chemicals are consumed inadvertently in food or drinks. Exposure can also occur through direct contact with products, particularly in the case of herbicides and pesticides. Cosmetics and certain insect repellents and sunscreens that contain endocrine disruptors are applied to the skin, resulting in direct exposure.

As was discovered with DDT, endocrine disruptors are not readily excreted from the body; rather, they are stored within fat in a process known as bioaccumulation. Moreover, the chemicals work their way up food chains. Endocrine disruptors that leach into the air, soil, or water are taken up by bacteria, algae, and plants. Those organisms are then consumed by higher organisms, including herbivores, which are then consumed by carnivores. As a consequence,

many mammals are also likely to transfer chemicals to their developing offspring in the womb. In humans and other placental animals, the developing fetus is exposed to any chemical that crosses the placenta, as well as to chemicals that have been stored in the mother's fat. Infants also are exposed to endocrine-disrupting chemicals through the mother's milk supply.
Endocrine-disrupting chemicals have far-reaching impacts on soil, water, and the health of plants and animals. When present at natural background levels, naturally occurring endocrine-modulating chemicals appear to have little negative impact on the health of environments and animals. Evidence suggests that in humans the consumption of small amounts of some naturally occurring substances, such as phytoestrogens found in certain vegetables, may actually benefit health. However, the vast majority of endocrine disruptors, including some phytoestrogens and especially chemicals that are human-made, pose significant health risks to humans and other animals, even when exposure occurs at only low levels.

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