

Seven substances added to 14th Report on Carcinogens

November 3 2016

Newly reviewed substances		
Substance	Listing Status	Description
Human immunodeficiency virus type 1 (HIV-1)	Known to be a human carcinogen	Virus
Human T-cell lymphotropic virus type 1 (HTLV-1)	Known to be a human carcinogen	Virus
Epstein-Barr virus (EBV)	Known to be a human carcinogen	Virus
Kaposi sarcoma-associated herpesvirus (KSHV)	Known to be a human carcinogen	Virus
Merkel cell polyomavirus (MCV)	Known to be a human carcinogen	Virus
Trichloroethylene (TCE)	Known to be a human carcinogen	Industrial solvent
Cobalt and cobalt compounds that release cobalt ions in vivo	Reasonably anticipated to be a human carcinogen	A metal and its compounds

14th Report on Carcinogens - Newly Reviewed Substances. Credit: NIEHS/NTP

Today's release of the U.S. Department of Health and Human Services 14th Report on Carcinogens includes seven newly reviewed substances, bringing the cumulative total to 248 listings.

The chemical trichloroethylene (TCE), and the metallic element cobalt and cobalt compounds that release cobalt ions in vivo, are being added to the list, as well as five viruses that have been linked to cancer in humans. The five viruses include [human immunodeficiency virus](#) type 1, human T-cell lymphotropic virus type 1, Epstein-Barr virus, Kaposi sarcoma-associated herpesvirus, and Merkel cell polyomavirus.

"Given that approximately 12 percent of human cancers worldwide may

be attributed to viruses, and there are no vaccines currently available for these five viruses, prevention strategies to reduce the infections that can lead to cancer are even more critical," said Linda Birnbaum, Ph.D., director of the National Institute of Environmental Health Sciences (NIEHS) and National Toxicology Program (NTP). "The listings in this report, particularly the viruses, bring attention to the important role that prevention can play in reducing the world's cancer burden. There are also things people can do to reduce their exposure to cobalt and TCE."

The Report on Carcinogens is a congressionally mandated report prepared for the HHS Secretary by NTP. The report identifies many different types of environmental factors, collectively called substances, including chemicals; infectious agents, such as viruses; physical agents, such as X-rays and ultraviolet radiation; mixtures of chemicals; and exposure scenarios in two categories—known to be a [human carcinogen](#) and reasonably anticipated to be a human carcinogen. The new report is available at <http://ntp.niehs.nih.gov/go/roc14>.

It's important to note that a listing in the report indicates a cancer hazard, but does not by itself mean that a substance or a virus will cause cancer. Many factors, including an individual's susceptibility to a substance, and the amount and duration of exposure, can affect whether a person will develop cancer. In the case of viruses, a weakened immune system may also be a contributing factor. People should talk to their health care providers about decreasing their cancer risk from viruses.

Cancer-causing viruses

All five viruses are being added to the category of known to be a human carcinogen. Collectively, these viruses have been linked to more than 20 different types of cancers.

- Human immunodeficiency virus type 1 (HIV-1) is a virus that is

spread through unprotected sexual activity, infected drug needles, during pregnancy from mother to child, and through infected breast milk. The HIV virus attacks the body's immune system, and causes AIDS. A weakened immune system is thought to increase a person's risk of getting several cancers caused by other viruses, including non-Hodgkin and Hodgkin lymphomas; anogenital cancers, including penile, vaginal/vulvar, cervix, and anal; Kaposi sarcoma; and possibly oral-related cancers; and liver cancer. It also increases the risk of other types of cancers, including non-melanoma skin cancer, eye cancer, and possibly lung cancer.

- Human T-cell lymphotropic virus type 1 (HTLV-1) is a virus that people are exposed to through contact with contaminated cells or biological tissues, such as breastfeeding, sharing of needles or syringes with infected individuals, or unprotected sexual activity. It is not transmitted by casual contact. Human epidemiological studies and molecular studies show that HTLV-1 causes adult T-cell leukemia-lymphoma, a rare cancer that infects the body's own T cells, specifically the white blood cells known as CD4 T cells, which help fight off infection.
- Epstein-Barr virus (EBV) is a herpesvirus, transmitted primarily through saliva. It is a common virus, infecting more than 90 percent of adults worldwide. Most people infected with EBV remain healthy and without symptoms. In some cases, EBV can cause infectious mononucleosis, also called mono. Human epidemiological studies, clinical studies, and molecular studies show that Epstein-Barr virus can lead to four types of lymphoma—Burkitt, Hodgkin, immune-suppression-related non-Hodgkin, and nasal type extranodal NK/T-cell—and two types of epithelial cancer—nasopharyngeal cancer and some types of stomach cancer.
- Kaposi sarcoma-associated herpesvirus (KSHV) is a herpesvirus transmitted from person to person primarily through saliva. It can

be transmitted through sexual contact, primarily among men who have sex with men. It can also be spread through blood, and transmitted from an infected mother to a child. Healthy individuals can be infected with the virus and show no signs or symptoms. There is sufficient human evidence linking KSHV to several cancers, including Kaposi sarcoma, and two rare lymphomas—primary effusion lymphoma and a specific plasmablastic variant of multicentric Castleman disease.

- Merkel cell polyomavirus (MCV) is a common virus that lives on the skin, though it rarely produces symptoms or leads to cancer. Healthy people continuously shed MCV from the skin surface. Close personal contact with saliva or skin of an infected individual may be how people are exposed to the virus. Human epidemiology studies in populations in different geographic locations, as well as clinical and molecular studies, show that Merkel cell polyomavirus causes Merkel cell carcinoma.

Trichloroethylene (TCE)

Trichloroethylene (TCE) is an industrial solvent used primarily to make hydrofluorocarbon chemicals. It is being listed in the Report on Carcinogens as a known human carcinogen. Since 2000, TCE had been listed as a reasonably anticipated human carcinogen. However, numerous human studies showing a causal association between TCE exposure and an increased risk for kidney [cancer](#) have led NTP to reevaluate and reclassify TCE as known to be a human carcinogen. There are many ways people can be exposed to TCE. It can be released into the air, water, and soil at places where it is produced or used. It breaks down slowly and can move readily through soil to make its way into underground drinking water sources. Because of its widespread use as a metal degreasing agent to maintain military equipment, it has been found in the groundwater at many military and Superfund sites.

Cobalt and cobalt compounds that release cobalt ions in vivo

Cobalt and cobalt compounds that release cobalt ions in vivo are being listed as reasonably anticipated to be a human carcinogen. The listing for cobalt includes different types of cobalt compounds that release ions into the body. It does not include vitamin B-12, because cobalt in this essential nutrient is bound to protein and does not release cobalt ions. Cobalt is a naturally occurring element used to make metal alloys and other metal compounds, such as military and industrial equipment, and rechargeable batteries. The highest exposure occurs in the workplace and from failed surgical implants. The listing for this metal and its compounds is based largely on studies in experimental animals.

Provided by National Institutes of Health

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