Cosmetics and Hair Dye

Millions of women and men around the world enhance or change their appearance with cosmetics and hair dye. The term makeup refers to cosmetics that are applied to the face and include foundation, eye shadow, eye liner, mascara, blush, lipstick, and more. Other common cosmetics include body wash, body lotion, shampoo, conditioner, hair spray, hair gel, perfume, and cologne.

Hair dyes fall into a separate category and are classified into three major groups – temporary, semipermanent, and permanent. Permanent hair color is mixed with colorless dye precursors and a stabilizer, and applied to the scalp and hair. This process results in a series of chemical reactions leading to the production of the final color, which becomes trapped in the hair.

Can cosmetics and hair dye affect your health?

Consumers may choose from hundreds of hair dye products that contain combinations of more than 5,000 different chemicals. Researchers are working to better understand if any of these compounds affect human health.

In the late 1970s, some hair dye chemicals were linked with cancer in laboratory animals, so many manufacturers removed these chemicals from their products. However, some dyes on the market today contain substances that are in the same chemical class as those removed.

Some chemicals in cosmetics and personal care products have already been classified as endocrine disrupting, which means they may interfere with the body’s hormones and may cause adverse health effects.
In addition, the NIEHS Sister Study on familial environmental risk for breast cancer found that women who douched had an increased risk of ovarian cancer.5

Is there a link between hair dye and cancer?
Many salon professionals have expressed concern about the potential cancer-causing nature of hair dye. Some studies have found an increased risk of bladder cancer in hairdressers.6 However, study results are mixed for people who personally use hair dyes, and the link to bladder and other cancers is uncertain.

A study conducted by the International Agency for Research on Cancer, part of the World Health Organization, concluded that occupational exposure to hair dye, such as that experienced by a hairdresser or barber, showed limited evidence in humans for the carcinogenicity. They also did not find enough evidence to show that personal use of hair dyes causes cancer.7

Is NIEHS working with other federal agencies?
In collaboration with the U.S. Environmental Protection Agency (EPA), National Institutes of Health, and the U.S. Food and Drug Administration (FDA), NTP is conducting toxicity testing of 10,000 chemical compounds, including those found in personal care and cosmetics products. The program is called Toxicology in the 21st Century, or Tox21. The goal is to develop new ways to rapidly test whether substances adversely affect human health.

Are cosmetics and hair dye regulated?
The Federal Food, Drug, and Cosmetic Act regulates the cosmetics and personal care industry in the United States. The law mandates that manufacturers report the safety of their products to the U.S. Food and Drug Administration (FDA). However, cosmetics do not undergo the same stringent level of premarket approval as drugs and pharmaceuticals, with the exception of color additives.8 Most of the hair dyes on the market today belong to a class called coal-tar hair dyes. The term coal-tar colors dates back to the time when these coloring materials were byproducts of the coal industry, though most are now made from petroleum. Unlike color additives in cosmetics, coal-tar hair dyes do not need FDA approval, as long as the label includes a special caution statement and the product comes with adequate directions for consumers to do a skin test before they dye their hair.

Where can I find more information on cosmetics and hair dye?
• U.S. Food and Drug Administration
  https://www.fda.gov/Cosmetics/ResourcesForYou/Consumers/ucm136560.htm

• American Cancer Society

• National Library of Medicine

• U.S. Food and Drug Administration
  https://www.fda.gov/Cosmetics/ProductsIngredients/Products/ucm143066.htm

For more information on the National Institute of Environmental Health Sciences, go to www.niehs.nih.gov.

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