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Antibacterial chemical disrupts hormone activities

A new UC Davis study shows that a common antibacterial chemical added to bath soaps can alter hormonal activity in rats and in human cells in the laboratory and does so by a previously unreported mechanism.

The findings come as an increasing number of studies ‑of both lab animals and humans ‑are revealing that some synthetic chemicals in household products can cause health problems by interfering with normal hormone action.

Called endocrine disruptors, or endocrine disrupting substances (EDS), such chemicals have been linked in animal studies to a variety of problems, including cancer, reproductive failure and developmental anomalies.

This is the first endocrine study to investigate the hormone effects of the antibacterial compound triclocarban (also known as TCC or 3,4,4'-trichlorocarbanilide), which is widely used in household and personal care products including bar soaps, body washes, cleansing lotions, wipes and detergents. Triclocarban-containing products have been marketed broadly in the United States and Europe for more than 45 years; an estimated 1 million pounds of triclocarban are imported annually for the U.S. market.

The researchers found two key effects: In human cells in the laboratory, triclocarban increased gene expression that is normally regulated by testosterone. And when male rats were fed triclocarban, testosterone-dependent organs such as the prostate gland grew abnormally large.

Also, the authors said their discovery that triclocarban increased hormone effects was new. All previous studies of endocrine disruptors had found that they generally act by blocking or decreasing hormone effects.

This finding may eventually lead to an explanation for some rises in some previously described reproductive problems that have been difficult to understand,‑said one author, Bill Lasley, a UC

Davis expert on reproductive toxicology and professor emeritus of veterinary medicine. More analyses of antibacterials and endocrine effects are planned, he said.

Consumers should not take this study as guidance on whether to use triclocarban-containing products, Lasley said. Our mothers taught us to wash our hands well before the advent of antimicrobial soaps, and that practice alone prevents the spread of disease.

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The new study was published online this week by the journal Endocrinology (Triclocarban enhances testosterone action: A new type of endocrine disruptor"， at: http://endo.endojournals.org/rep.shtml).

The nine authors are Lasley; Jiangang Chen; Ki Chang Ahn; Nancy Gee, Mohamed I. Mohamed, Antoni Duleba, Ling Zhao, Shirley Gee and Bruce Hammock. They are associated with these UC Davis programs: Center for Health and the Environment; Department of Entomology; California National Primate Research Center; Division of Reproductive Endocrinology and Infertility at the School of Medicine; Department of Nutrition; and the Cancer Center.

In their disclosure statement, the authors report that six of them have taken steps to patent their findings through the University of California.

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