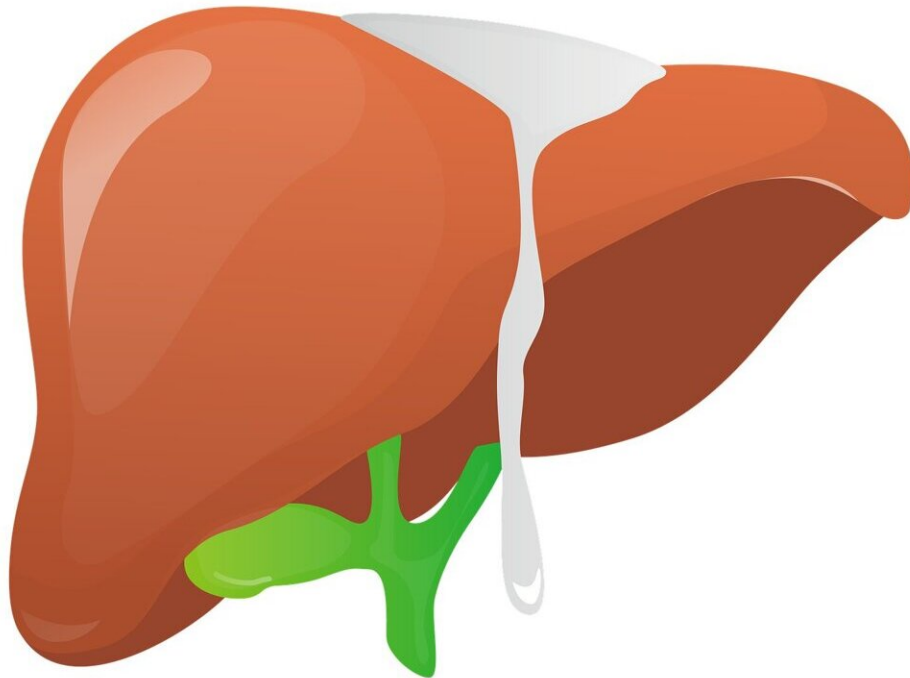


Lactating mice pass along common antimicrobial to pups, initiating liver damage

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In mouse studies, researchers at University of California San Diego School of Medicine report that lactating mothers expose their feeding pups to triclosan, an antimicrobial commonly used in consumer products,

resulting in early signs of liver damage that can eventually lead to more serious impairment and illness, such as nonalcoholic fatty liver disease (NAFLD) and nonalcoholic steatohepatitis (NASH).

The findings published in the July 27, 2022 online issue of *Nature Communications*.

NAFLD is the most common chronic [liver](#) condition in the United States, affecting an estimated 100 million adults. It occurs when fat accumulates in [liver cells](#) due to causes other than [excessive alcohol use](#), impairing organ function. The precise cause is not known, but diet and genetics play substantial roles. Up to 50 percent of obese people are believed to have NAFLD.

Approximately 20 percent of persons with NAFLD transition to NASH, a more advanced form of the disease characterized by increasingly severe inflammation and organ damage that may result in scarring of the liver, cirrhosis and cancer.

According to a study published by UC San Diego scientists in June 2022, NASH is the fastest growing cause of liver cancer deaths globally, especially in the Americas. It is driven by rapidly rising obesity rates. The prevalence of obesity in the U.S. in 2017 was 42.4 percent, according to the Centers for Disease Control, up from 30.5 percent in 2000.

The prevalence of NAFLD in children is rising, along with obesity rates in the young. It is estimated that 9.6 percent of children ages 2 to 19 years have NAFLD. A recent study by UC San Diego scientists found that pediatric NAFLD increases the risk of developing type 2 diabetes later in life.

Triclosan is an ingredient added to diverse consumer products to reduce

or prevent microbial contamination, including soaps, toothpaste, cosmetics, clothing, furniture, kitchenware, pesticides and toys.

"Triclosan is a broad-spectrum antimicrobial agent that is used in many [personal care products](#), and impregnated in numerous different materials, ranging from clothing to food packaging. It has been linked to multiple adverse health effects," said the study's corresponding author Robert H. Tukey, Ph.D., professor in the Department of Pharmacology at UC San Diego School of Medicine.

In 2016, fueled by rising evidence and public health concerns, the U.S. Food and Drug Administration banned the use of triclosan in some products and required premarket approval for others. It remains an ingredient in many products.

Two years ago, Tukey, study co-author Michael Karin, Ph.D., Distinguished Professor of Pharmacology and Pathology at UC San Diego School of Medicine, and colleagues published evidence that triclosan exposure worsened fatty liver disease in mice fed a [high-fat diet](#). The latest research builds upon how that happens, showing that triclosan is passed from nursing mothers to pups, who develop early signs of fatty liver pathogenesis and perhaps a greater likelihood of fatty liver disease later in life.

The researchers exposed pregnant females to triclosan in their diet and found that it was efficiently transferred by lactation to newborn mice, causing significant fatty liver during the suckling period, and resulting in hepatosteatosis, triglyceride accumulation, endoplasmic reticulum stress, signs of inflammation and liver fibrosis. Two key metabolic regulators responsible for triclosan-induced fatty liver disease were identified.

"Early exposure to triclosan appears to trigger pathologies that resemble NAFLD and NASH: toxicant associated fatty liver disease and toxicant

associated [fatty liver disease](#), which may predispose development of pediatric NAFLD and NASH," said Tukey. "Recent increases in pediatric NAFLD could be a consequence of mother-to-child transmission of environmental toxicants like triclosan."

Co-authors include: Andre A. Weber, Xiaojing Yang, Elvira Mennillo, Jeffrey Ding, Jeramie D. Watous, Mohit Jain and Shujuan Chen, all at UC San Diego.

More information: Please click the link to read [André A. Weber et al. Lactational delivery of Triclosan promotes non-alcoholic fatty liver disease in newborn mice, *Nature Communications* \(2022\). DOI: 10.1038/s41467-022-31947-4](#)

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