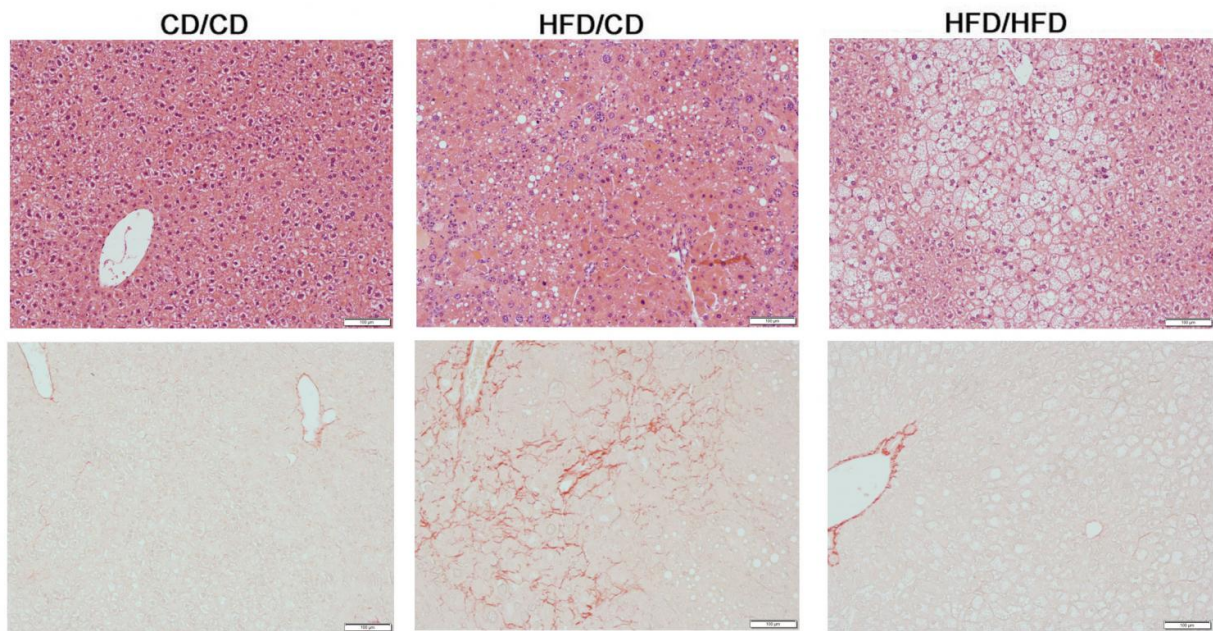


Maternal high-fat diet may increase offspring risk for liver disease

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The researchers found that offspring of pregnant mice that consumed a high fat diet developed liver fibrosis, a type of tissue scarring that is a sign that more serious disease will develop. The top row is H/E staining and the bottom row Sirius red staining, which shows fibrosis. The top labels show the maternal diet first and post-weaning diet second (CD = control diet; HFD = high-fat diet).
Credit: Michael Thompson, MD, PhD, Nationwide Children's Hospital.

Nonalcoholic fatty liver disease, a condition where fat builds up in the liver, is now the most common chronic liver disease diagnosed in adults

and children. Although the disease is linked with obesity, scientists don't fully understand why some people develop it and others don't. Findings from a new mouse study suggest that exposure to a high-fat diet in the womb and immediately after birth may change the liver in a way that promotes more rapid progression of nonalcoholic fatty liver disease later in life.

Michael Thompson, MD, PhD, pediatric endocrinology fellow at Nationwide Children's Hospital, will present the new research at the American Society for Investigative Pathology annual meeting during the Experimental Biology 2017 meeting, to be held April 22-26 in Chicago.

"Complications of obesity are a significant cost burden for the medical system, especially given the prevalence of obesity," said Thompson. "Understanding how maternal exposures impact obesity-related disease such as nonalcoholic [fatty liver disease](#) will allow us to develop lower cost preventative therapies to utilize up front rather than awaiting complications down the road."

In the new study, the researchers found that the offspring of pregnant mice that consumed a [high-fat diet](#) developed liver fibrosis, a type of tissue scarring that is a sign that more serious disease will develop. The offspring weaned to a low-fat diet after maternal high-fat diet exposure developed fibrosis in adulthood. The livers of these mice also had signs of fat accumulation and inflammation.

The findings showed that developmental exposure to a high-fat diet can produce changes in the liver that last into adulthood, even with consumption of a low-fat diet after birth. These findings could have implications for people who are not obese themselves but who had obese mothers.

Additional analysis showed that bile acid levels and genes involved in

bile-acid regulation were changed in the offspring exposed to the maternal high-fat diet. This finding suggests that the offspring may have a [liver](#) disease called cholestasis, which occurs when the normal flow of bile is impaired.

"If human offspring from [obese mothers](#) have a similar risk for developing fibrosis as we see in mice, we may be able to predict who is going to develop more serious disease," said Thompson. "Knowing who is most at risk for more serious disease will guide us on which patients should be treated more aggressively. Furthermore, understanding the biological mechanisms involved in this increased risk could lead to preventative therapies."

The researchers are now working to further understand the mechanisms involved in the risk for [disease](#) progression. They also plan to use their mouse model of developmental high-fat [diet](#) exposure to evaluate preventative therapies that could be administered during pregnancy or to the offspring.

More information: [app.core-apps.com/eb2017/abstr ...
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Provided by Experimental Biology 2017

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