

High-fat diet during puberty speeds up breast cancer development

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MSU researchers Sandra Haslam and Richard Schwartz have discovered that a high-fat diet during puberty speeds up breast cancer development. Credit: Photo by G.L. Kohuth

New findings show that eating a high-fat diet beginning at puberty speeds up the development of breast cancer and may actually increase the risk of cancer similar to a type often found in younger adult women.

The research comes from the Breast Cancer and the Environment

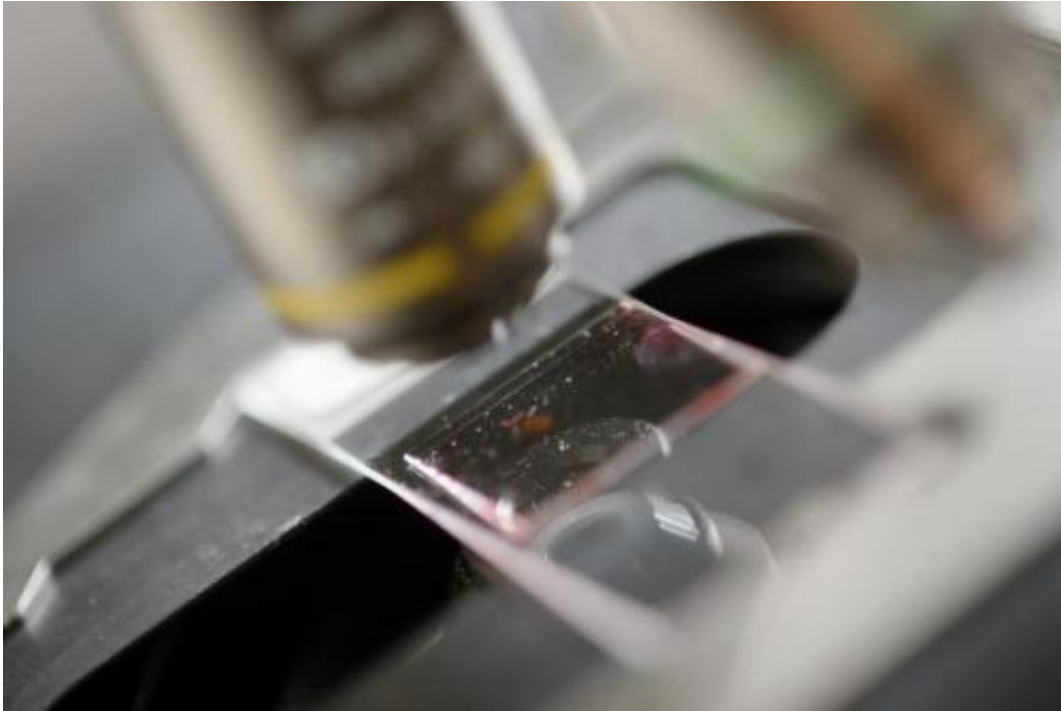
Research Program at Michigan State University and is published in the current online issue of *Breast Cancer Research*.

Utilizing a preclinical model, the findings indicate that before any tumors appear, there are changes in the breast that include increased cell growth and alterations in immune cells. These changes persist into adulthood and can lead to the rapid development of precancerous lesions and ultimately breast cancer.

In addition to the accelerated breast cancer development, this type of diet produces a distinct gene signature in the tumors consistent with a subset of breast cancers known as basal-like that can carry a worse prognosis.

"This is very significant because even though the cancers arise from random mutations, the [gene signature](#) indicating a basal-like breast cancer shows the overarching and potent influence this type of diet has in the breast," said Sandra Haslam, physiology professor in MSU's College of Human Medicine and one of the lead investigators of the project.

"Cancers of this type are more aggressive in nature and typically occur in younger women. This highlights the significance of our work toward efforts against the disease."



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Richard Schwartz, microbiology professor and associate dean in the College of Natural Science, has co-led research efforts with Haslam since 2010. The research is funded by a five-year, \$2.3 million federal grant from the National Institute of Environmental Health Sciences and the National Cancer Institute.

"It's important to note that since our experimental model did not involve any weight gain from the high-fat diet, these findings are relevant to a much broader segment of the population than just those who are overweight," said Schwartz. "This shows the culprit is the fat itself rather than weight gain."

Early evidence indicates that the fat, which in this case was saturated

animal fat, could potentially have permanent effects even if a low-fat diet is introduced later in life. Schwartz cautions, however, that this preliminary finding requires further investigation and doesn't indicate with certainty that humans will be affected in the same way.

"Overall, our current research indicates that avoiding excessive dietary fat of this type may help lower one's risk of breast cancer down the road," he said. "And since there isn't any evidence suggesting that avoiding this type of diet is harmful, it just makes sense to do it."

The research project is part of a consortium, the national Breast Cancer and the Environment Research Program, which studies the impact of prenatal-to-adult environmental exposures that predispose women to breast cancer.

Besides performing biomedical research, the project also strives to communicate findings that can lessen the risk of [breast cancer](#) through awareness and avoidance of environmental risk factors. Haslam and Schwartz have partnered with the Michigan Breast Cancer Coalition and professors Kami Silk and Sandi Smith in MSU's College of Communication Arts and Sciences to bring these research findings to the public.

More information: breast-cancer-research.com/content/15/5/R100/abstract

Provided by Michigan State University

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