Eliminating the 'good cholesterol' receptor may fight breast cancer

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Removing a lipoprotein receptor known as SR-BI may help protect against breast cancer, as suggested by new findings presented at the American Association for Cancer Research Annual Meeting 2012 by Jefferson's Kimmel Cancer Center researchers.

In vitro and mouse studies revealed that depletion of the SR-BI resulted in a decrease in breast cancer cell growth.

SR-BI is a receptor for high-density lipoproteins (HDL) that are commonly referred to as "good cholesterol" because they help transport cholesterol out of the arteries and back to the liver for excretion.

The team, including Christiane Danilo, of the Department Stem Cell Biology and Regenerative Medicine at Thomas Jefferson University, and Philippe G. Frank, Ph.D., an assistant professor in the Department of Stem Cell Biology and Regenerative Medicine at Jefferson, had good reason to believe that SR-BI played a role in breast cancer growth: Previous lab research had revealed that mice fed a high cholesterol diet develop more advanced tumors and their tumors produce more SR-BI.

To further investigate SR-BI's role in breast cancer tumors, the team manipulated levels of the receptor in human breast cancer cell lines and examined its effect on tumor formation in a mouse model.

In vitro, they found that ablation of the receptor protein in breast cancer cells led to a decrease in cancer cell proliferation, migration and

invasion. Mouse models also showed that depletion of the receptor could confer protection against tumor growth.

Environmental factors, such as diet and obesity, have long been considered risk factors for the high breast cancer incidence in the Western world, and epidemiologic evidence indicates that cancer patients display abnormal levels of cholesterol carrying lipoproteins. However, the role of cholesterol in breast cancer had not yet been specifically examined.

"The results of this novel study show that depletion of SR-BI reduces cancer cell and tumor growth, suggesting that it could play an important role in breast cancer," said Dr. Frank. "More studies are warranted to further characterize the role of SR-BI in tumor progression."

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