Medical Xpress

Low-dose aspirin stymies proliferation of two breast cancer lines, study finds

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Regular use of low-dose aspirin may prevent the progression of breast cancer, according to results of a study by researchers at the Veterans Affairs Medical Center in Kansas City, Mo., and the University of Kansas Medical Center. The study found that aspirin slowed the growth of breast cancer cell lines in the lab and significantly reduced the growth of tumors in mice. The age-old headache remedy also exhibits the ability to prevent tumor cells from spreading.

The lead author of the study, Gargi Maity, a postdoctoral fellow who works in the cancer research unit at the VA Medical Center, will present the team's findings on Sunday, April 21, at the annual meeting of the American Society for Biochemistry and Molecular Biology, which is being held in conjunction with the Experimental Biology 2013 conference in Boston. The senior author is Sushanta Banerjee, director of the cancer research unit and a professor at the University of Kansas Medical Center in Kansas City, Kan.

The role of aspirin, or acetylsalicylic acid, in preventing and treating cancer has intrigued researchers since the late 1980s, when an Australian study found that people who regularly used aspirin were less likely to develop colorectal cancer. Aspirin use also has been shown to reduce the risk of squamous cell esophageal cancer and prostate cancer.

Anecdotal evidence indicated that breast cancer was less likely to return in women who took aspirin to lower their risk of heart attack or stroke. But the science behind this relationship is not well understood.

The VA study found that aspirin may interfere with cancer cells' ability to find an aggressive, more primordial state. In the mouse model the researchers used, cancer cells treated with aspirin formed no or only partial stem cells, which are believed to fuel the growth and spread of tumors.

Banerjee, a professor of medicine in division of hematology and oncology, says first-line chemotherapy treatments do not destroy stem cells. Eventually, the tumor will grow again. "If you don't target the stemness, it is known you will not get any effect," he says. "It will relapse."

In lab tests, aspirin blocked the proliferation of two different breast cancer lines. One of the lines tested is often called triple-negative breast cancer, a less common but more difficult treat form of the disease. "We are mainly interested in triple negative breast cancer, because the prognosis is very poor," Banerjee says.

Triple-negative breast cancers, which will be addressed in a special thematic program at the ASBMB annual meeting, lack receptors for estrogen, progesterone and Her2. Aspirin also may improve the effectiveness of current treatments for women whose breast cancers are hormone-receptor positive. In the team's study, aspirin enhanced the effect of tamoxifen, the usual drug therapy for hormone-receptor positive breast cancer.

Aspirin is used in the treatment of a number of different conditions. Banerjee says its ability to attack multiple metabolic pathways is what makes it potentially useful in the fight against cancer. "Cancer is not a single-gene disease," he says. "Multiple genes are involved."

Aspirin is a medicine with side effects, including gastrointestinal bleeding. Researchers will continue to explore if the positive effects of

regular use of the drug outweigh the risks. In 2012, the National Cancer Institute asked scientists to design studies that would illuminate the mechanisms by which aspirin and drugs with other uses appear to reduce the risk of cancer or improve the prognosis for those diagnosed with the disease. Banerjee says his lab will apply for one of the grants.

Provided by Federation of American Societies for Experimental Biology

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