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Researchers find a weak link in cancer cell armor

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(PhysOrg.com) -- Professor Robert Weiss has found that when two particular genes are inhibited, cancer cells are destroyed at a greater rate. The study is published in the Nov. 9 issue of PNAS.

It has long been known that the so-called p53 gene suppresses tumors -- when it mutates, cancer cells take hold and multiply. New research at Cornell's College of Veterinary Medicine, however, shows that inhibiting a second gene (Hus1) is lethal to cells with p53 mutations, knowledge that has scientists investigating whether the same combination may kill cancerous cells.

Using a mouse model, senior author Robert Weiss, associate professor of molecular genetics, first author and graduate student Stephanie Yazinski and colleagues explored how cells respond when both genes are inhibited. When they inactivated the Hus1 gene in healthy mammary gland tissues, the researchers report, it caused genome damage and cell death. And when they studied the effects of Hus1 inactivation in p53-deficient cells, which are highly resistant to cell death, they discovered that the ability of Hus1 inactivation to kill cells was even greater.

The study is published in the Nov. 9 issue of the Proceedings of the National Academy of Sciences.

"Our work contributes to an important new understanding of cancer cells and their weaknesses," Weiss said. "The mutations that allow cancer

cells to divide uncontrollably also make the cancer cells more dependent on certain cellular processes. We were able to exploit one such dependency of p53-deficient cells and could efficiently kill these cells by inhibiting Hus1."

Weiss and his team have new experiments under way.

"We've proven the power of inhibiting both pathways in normal tissue," said Weiss. "Now we want to extend our knowledge to cancerous tissue and determine if the loss of Hus1 will impact the ability of cancers with p53 mutations to take hold and grow."

Weiss' research was funded by the National Institutes of Health and is now funded through 2013 in part by the American Recovery and Reinvestment Act (ARRA). To date, Cornell has received 124 ARRA grants, totaling more than $99.9 million. Weiss's ARRA funding will support one faculty and two student positions as well as the research activities of several additional lab members.

Provided by Cornell University (news : web)

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