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Estrogen-targeting drug combo may help lung cancer

Research shared at joint AACR-IALSC Conference Jan. 8 -11 in San Diego

SAN DIEGO — A combination of drugs that target estrogen production significantly reduced the number of tobacco carcinogen-induced lung tumors in mice, according to results from a preclinical study.

“Antiestrogens have been shown to prevent breast cancer in some women,” said Jill M. Siegfried, Ph.D., professor in the department of pharmacology and chemical biology at University of Pittsburgh Cancer Institute. “If antiestrogens can prevent lung cancer as well, this would be a major advance, because these drugs are safe to give for long periods and there are no approved ways to prevent lung cancer.”

Siegfried presented the results at the AACR-IALSC Joint Conference on Molecular Origins of Lung Cancer: Biology, Therapy and Personalized Medicine, held Jan. 8-11, 2012.

Most lung cancers are positive for a type of estrogen receptor that makes lung tumors grow when exposed to estrogen. In addition, an enzyme in the lung called aromatase produces estrogen.

Siegfried and colleagues hoped that by blocking this estrogen receptor and the aromatase enzyme, they might be able to prevent estrogen-sensitive lung tumors.

To test this theory, they conducted a study on two groups of female mice: one group that was currently being exposed to a tobacco carcinogen and one that had past exposure to a tobacco carcinogen and in which some precancerous cells had already formed. The mice were assigned to treatment with a placebo, the aromatase inhibitor anastrozole, the antiestrogen fulvestrant or a combination of anastrozole and fulvestrant.

“The first model asks whether the treatments inhibit the process by which cancer is first started before it is even detectable under the microscope, and the second asks whether the treatments inhibit the process by which microscopic precancers develop into visible tumors,” Siegfried said.

In the first model, the combination treatment given during carcinogen exposure resulted in significantly fewer lung cancer tumors compared with placebo or either treatment alone. The tobacco carcinogen was stopped once treatment began to maximize its ability to halt lung cancer development. Combination treatment also resulted in maximum antitumor effects in the second model, where precancerous cells were already present.

According to Siegfried, these results suggest that antiestrogen treatment combined with an aromatase inhibitor prevents lung cancer development during tobacco carcinogen exposure and after carcinogen damage to the airways has already occurred.

Siegfried said that ultimately, the hope is that this research could lead to an approved treatment that could greatly reduce the risk for an ex-smoker to develop lung cancer.

“We may be able to prevent lung cancer in people who have been previously exposed to tobacco carcinogens using some of the same antiestrogen drugs that can prevent breast cancer,” Siegfried said. “A lot of work needs to be done to determine who would benefit from this therapy, and these drugs would need to be tested in clinical trials in those at high risk for lung cancer.”

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About the IASLC:

The International Association for the Study of Lung Cancer (IASLC) is the only global organization dedicated to the study of lung cancer. Founded in 1974, the association’s membership includes more than 3,500 lung cancer specialists in 80 countries.

IASLC members promote the study of etiology, epidemiology, prevention, diagnosis, treatment and all other aspects of lung cancer and thoracic malignancies. IASLC disseminates information about lung cancer to scientists, members of the medical community and the public, and uses all available means to eliminate lung cancer as a health threat for the individual patients and throughout the world. Membership is open to any physician, scientist, nurse or allied health professional interested in lung cancer, including patients, survivors, caregivers and advocates.

IASLC publishes the *Journal of Thoracic Oncology*, a valuable resource for medical specialists and scientists who focus on the detection, prevention, diagnosis and treatment of lung cancer.

To learn more about IASLC please visit <http://iaslc.org/>

About the AACR:

The mission of the American Association for Cancer Research is to prevent and cure cancer. Founded in 1907, the AACR is the world’s oldest and largest professional organization dedicated to advancing cancer research. The membership includes 33,000 laboratory, translational and clinical researchers; health care professionals; and cancer survivors and advocates in the United States and more than 90 other countries. The AACR marshals the full spectrum of expertise from the cancer community to accelerate progress in the prevention, diagnosis and treatment of cancer through high-quality scientific and educational programs. It funds innovative, meritorious research grants, research fellowships and career development awards to young investigators, and it also funds cutting-edge research projects conducted by senior researchers. The AACR has numerous fruitful collaborations with organizations and foundations in the United States and abroad and functions as the Scientific Partner of Stand Up To Cancer, a charitable initiative that supports groundbreaking research aimed at getting new cancer treatments to patients in an accelerated time frame. The AACR Annual Meeting attracts more than 17,000 participants who share the latest discoveries and developments in the field. Special Conferences throughout the year present novel data across a wide variety of topics in cancer research, treatment and patient care, and Educational Workshops are held for the training of young cancer investigators. The AACR publishes seven major peer-reviewed journals: *Cancer Discovery*; *Cancer Research*; *Clinical Cancer Research*; *Cancer Epidemiology, Biomarkers & Prevention*; *Molecular Cancer*

Therapeutics; Molecular Cancer Research; and Cancer Prevention Research. In 2010, AACR journals received 20 percent of the total number of citations given to oncology journals. The AACR also publishes *Cancer Today*, a magazine for cancer patients, survivors and their caregivers, which provides practical knowledge and new hope for cancer survivors. A major goal of the AACR is to educate the general public and policymakers about the value of cancer research in improving public health, the vital importance of increases in sustained funding for cancer research and biomedical science, and the need for national policies that foster innovation and the acceleration of progress against the 200 diseases we call cancer.