

Media Contact: Debbie Bolles
214-648-3404
debbie.bolles@utsouthwestern.edu

UT Southwestern research uncovers genetic link between emphysema, lung cancer

DALLAS – June 9, 2011 – A gene linked to emphysema also can be a factor for developing lung cancer unrelated to cigarette smoking, UT Southwestern Medical Center research indicates. Smoking was the only known risk factor previously associated with both diseases.

In the study, mice bred to have the human gene *pleiomorphic adenoma gene-like 2* (*PLAGL2*) all developed emphysema, and by gender also developed lung cancer at rates as high as one in every six rodents. Although the new study showed *PLAGL2* as a contributing factor in emphysema and lung cancer development, the diseases form in opposite ways. Emphysema arises from cell death or injury, while lung cancer involves uncontrolled cell growth.

“We think this gene induces emphysema by causing stem cells in the lung to die,” said Dr. Jonathan Weissler, vice chairman of the department of medicine and chief of medicine at UT Southwestern University Hospital and senior author of the study, available online and due to be published in the journal *Lung Cancer* in October. “The cells that don’t die through apoptosis would be more likely to have uncontrolled growth” and become cancerous, suggesting a genetic link between the diseases.

The gene is a known driver of several types of cancer. The degree to which *PLAGL2* turns on, or is expressed, plays a role in cancer development. Previous research has demonstrated that female lung cancer patients with higher levels of gene expression had much poorer survival rates.

Increased *PLAGL2* expression also aggravates emphysema. In 2009, Dr. Weissler and UT Southwestern colleagues found that high expression of this gene led to enlarged airways (alveoli) in mice. Female mice in particular were more prone to develop emphysema.

“The mice in that study developed the same type of emphysema seen in smokers despite the fact they were not exposed to cigarette smoke,” said Dr. Weissler, director of the James M. Collins Center for Biomedical Research.

The new study revealed higher incidence of lung cancer in male mice. Of two *PLAGL2* mice groups tested, lung cancer developed in 12.5 percent and 18.5 percent of male mice. The

(MORE)

Emphysema, lung cancer link – 2

rate for female mice was zero and 3.7 percent.

In human cases, the association between these two diseases also is stronger in men. One study showed that about 10 percent of patients with severe emphysema – all men – also had lung cancer. The reasons for these gender differences are as yet unknown, although this information eventually could be used to help identify patients at risk for cancer.

“*PLAGL2* expression could be used as a marker for cells that are at risk of undergoing malignant transformation,” Dr. Weissler said.

Other researchers involved in the study were lead authors Dr. Yih-Sheng Yang and Dr. Meng-Chun Yang, both former assistant professors of internal medicine at UT Southwestern.

The study was supported by the National Heart, Lung and Blood Institute, the Will Rogers Institute and the Collins Center for Biomedical Research.

Visit www.utsouthwestern.org/cancer to learn more about UT Southwestern’s clinical services in cancer.

###

This news release is available on our World Wide Web home page at
www.utsouthwestern.edu/home/news/index.html

To automatically receive news releases from UT Southwestern via email,
subscribe at www.utsouthwestern.edu/receivenews