Public release date: 20-Aug-2010

Contact: Kaitlin Vangura

kvangura@rubenstein.com

212-821-0560

New York- Presbyterian Hospital/Weill Cornell Medical Center/Weill Cornell Medical College

Cigarette smoke causes harmful changes in the lungs even at the lowest levels

First study to show alteration in the function of genes in the lungs resulting from secondhand and low-level smoking

NEW YORK (August 20, 2010) -- Casual smokers may think that smoking a few cigarettes a week is "no big deal." But according to new research from physician-scientists at NewYork-Presbyterian Hospital/Weill Cornell Medical Center, having an infrequent smoke, or being exposed to secondhand smoke, may be doing more harm than people may think. The findings may further support public smoking bans, say the authors.

According to a new study published today in the *American Journal of Respiratory and Critical Care Medicine*, being exposed to even low-levels of cigarette smoke may put people at risk for future lung disease, such as lung cancer and chronic obstructive pulmonary disease (COPD).

Epidemiological studies have long shown that secondhand smoke is dangerous, but there have never been conclusive biological tests demonstrating what it does to the body at a gene function level, until now.

"Even at the lowest detectable levels of exposure, we found direct effects on the functioning of genes within the cells lining the airways," says Dr. Ronald Crystal, senior author of the study and chief of the division of pulmonary and critical care medicine at NewYork-Presbyterian/Weill Cornell and chair of the department of genetic medicine at Weill Cornell Medical College in New York City.

Dr. Crystal explains that genes, commonly activated in the cells of heavy smokers, are also turned on or off in those with very low-level exposure.

"The genetic effect is much lower than those who are regular smokers, but this does not mean that there are no health consequences," says Dr. Crystal. "Certain genes within the cells lining the airways are very sensitive to tobacco smoke, and changes in the function of these genes are the first evidence of 'biological disease' in the lungs or individuals."

To make their findings, Dr. Crystal and his collaborators tested 121 people from three different categories: "nonsmokers," "active smokers" and "low exposure smokers." The researchers tested urine levels of nicotine and cotinine -- markers of cigarette smoking within the body -- to determine each participant's category.

The research team then scanned each person's entire genome to determine which genes were either activated or deactivated in cells lining the airways. They found that there was no level of nicotine or cotinine that did not also correlate with genetic abnormalities.

"This means that no level of smoking, or exposure to secondhand smoke, is safe," says Dr. Crystal. He goes on to say that these genetic changes are like a "canary in a coal mine," warning of potential life-threatening disease, "but the canary is chirping for low-level exposure patients, and screaming for active smokers."

Dr. Crystal says that this is further evidence supporting the banning of smoking in public places, where non-smokers, and employees of businesses that allow smoking, are put at risk for future lung disease.

###

Co-authors of the study include Yael Strulovici-Barel, Dr. Michael O'Mahony, Dr. Cynthia Gordon, Dr. Charleen Hollmann, Dr. Ann Tilley, Jacqueline Salit, Dr. Ben-Gary Harvey, all from NewYork-Presbyterian/Weill Cornell; Dr. Jason Mezey from Cornell University in Ithaca, New York and Weill Cornell Medical College in New York City; and Dr. Larsson Omberg from Cornell University.

Funding for the study came from grants from the National Institutes of Health, The Flight Attendant's Medical Research Institute, and the Cornell Center for Comparative and Population Genomics.

NewYork-Presbyterian Hospital/Weill Cornell Medical Center

NewYork-Presbyterian Hospital/Weill Cornell Medical Center, located in New York City, is one of the leading academic medical centers in the world, comprising the teaching hospital NewYork-Presbyterian and Weill Cornell Medical College, the medical school of Cornell University.

NewYork-Presbyterian/Weill Cornell provides state-of-the-art inpatient, ambulatory and preventive care in all areas of medicine, and is committed to excellence in patient care, education, research and community service. Weill Cornell physician-scientists have been responsible for many medical advances -- including the development of the Pap test for cervical cancer; the synthesis of penicillin; the first successful embryo-biopsy pregnancy and birth in the U.S.; the first clinical trial for gene therapy for

Parkinson's disease; the first indication of bone marrow's critical role in tumor growth; and, most recently, the world's first successful use of deep brain stimulation to treat a minimally conscious brain-injured patient. NewYork-Presbyterian Hospital also comprises NewYork-Presbyterian Hospital/Columbia University Medical Center, NewYork-Presbyterian/Morgan Stanley Children's Hospital, NewYork-Presbyterian Hospital/Westchester Division and NewYork-Presbyterian/The Allen Hospital. NewYork-Presbyterian is the #1 hospital in the New York metropolitan area and is consistently ranked among the best academic medical institutions in the nation, according to U.S.News & World Report. Weill Cornell Medical College is the first U.S. medical college to offer a medical degree overseas and maintains a strong global presence in Austria, Brazil, Haiti, Tanzania, Turkey and Qatar. For more information, visit www.nyp.org and www.med.cornell.edu.
