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Columbia University's Mailman School of Public Health

Mailman School of Public Health researchers report blood DNA can be early predictor of liver cancer

Researchers at Columbia University's Mailman School of Public Health have discovered a means for early detection of liver cancer. Using DNA isolated from serum samples as a baseline biomarker, the scientists examined changes in certain tumor suppressor genes that have been associated with the development of liver carcinomas. This is the first study to prospectively examine potential biomarkers for early detection of liver cancer in high-risk populations, including those with chronic hepatitis B and C virus infections.

Since most hepatocellular or liver carcinomas (HCC) are diagnosed at an advanced and usually fatal stage, the development of screening methods for early detection is critical. HCC is one of the most common and rapidly fatal human malignancies. Worldwide, the almost 500,000 new cases and nearly equivalent number of fatalities illustrates the lack of effective therapeutic alternatives for this disease.

The Mailman School researchers and colleagues studied the blood of patients enrolled in a cancer screening program in Taiwan, who provided repeated blood samples prior to diagnosis. A total of 12,000 males and over 11,900 females recruited in 1991-2 are being followed. Screenings performed by the team of Mailman School scientists found changes associated with cancer in serum DNA, presumably released from the tumor, one to nine years before actual clinical diagnosis.

Certain clinical risk factors such as age and hepatitis B and C virus infections, are well documented risk factors for the development of HCC. According to the study findings, these factors coupled with smoking and alcohol status, and alterations found in this study in serum DNA, resulted in an overall predictive accuracy of 89% for detection of HCC.

These are extremely encouraging findings, says Regina Santella, PhD, professor of Environmental Health Sciences at the Mailman School of Public Health, director of the Columbia's NIEHS Center for Environmental Health in Northern Manhattan, and principal

investigator on the research. aving the tools to identify hepatocellular carcinoma at earlier stages, is truly a breakthrough for addressing the challenges that result from this highly lethal form of cancer. /p>

Dr. Santella and the team of researchers previously found that several environmental factors including aflatoxin B1, a dietary mold contaminant sometimes found in peanuts and corn; polycyclic aromatic hydrocarbons, ubiquitous environmental contaminants; and 4-aminobiphenyl, a carcinogen found in cigarette smoke, are also associated with the development of HCC. While HCC incidence is highest in East Asia and Sub-Saharan Africa, it is also increasing in the U.S primarily as a result of HCV infection.

We are not only very excited about what this means in terms of early detection for hepatocellular cancer but optimistic about how it could also be applied to other cancers, observes Dr. Santella.

The full study findings are published in the April 15, 2007 issue of Clinical Cancer Research.

About the Mailman School of Public Health

The only accredited school of public health in New York City, and among the first in the nation, Columbia University's Mailman School of Public Health provides instruction and research opportunities to more than 950 graduate students in pursuit of masters and doctoral degrees. Its students and over 300 multi-disciplinary faculty engage in research and service in the city, nation, and around the world, concentrating on biostatistics, environmental health sciences, epidemiology, health policy and management, population and family health, and sociomedical sciences. (www.mailman.hs.columbia.edu)