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Blood test can help identify the target population to screen for lung cancer

Lyon, France, 12 July 2018 – A new study by researchers from the International Agency for Research on Cancer (IARC), published today in *JAMA Oncology*, demonstrates that a blood test measuring four protein biomarkers can improve the identification of individuals who would later develop lung cancer. These biomarkers may help refine the criteria for including current and former smokers in lung cancer screening programmes, using low-dose computed tomography (CT) scans, aimed at reducing deaths from this common cancer.¹

“By using information from four blood-based protein biomarkers together with smoking information, we were able to identify 63% of future lung cancer patients among former and current smokers, compared with only 42% using current eligibility criteria for CT screening in the USA,” says IARC scientist Dr Mattias Johansson, one of the study’s principal investigators. “Our study demonstrated that biomarkers have the potential to significantly improve the identification of those individuals who are most likely to benefit from screening.”

The burden of lung cancer mortality and the potential for early detection

Lung cancer is responsible for 20% of all cancer-related deaths around the world. Reducing the prevalence of tobacco smoking is the most important way to prevent lung cancer, as well as other tobacco-associated cancers worldwide. The number of deaths from lung cancer can be decreased by reducing exposure to tobacco and other known risk factors, such as air pollution and radon. In addition, CT screening has the potential to reduce lung cancer mortality by detecting cancers at an early stage, when curative treatment is still possible.

“This is the first study to systematically demonstrate that a panel of protein markers can improve the identification of future lung cancer cases,” says Dr Paul Brennan, Head of the Section of Genetics at IARC and one of the study’s principal investigators. “This test could be used to improve current screening eligibility criteria and increase the benefits of CT screening.”

¹ The vast majority (80–90%) of lung cancers are caused by tobacco exposure. Survival rates for lung cancer are generally poor, because most patients are diagnosed when the cancer is at an advanced stage. The potential for early detection of lung cancer through screening was demonstrated in 2011 in the USA by the National Lung Screening Trial (NLST), in which individuals who underwent CT screening had 20% lower lung cancer mortality rates. Screening for lung cancer with low-dose CT scans is currently recommended in the USA for individuals who are at high risk of lung cancer based on their age and history of smoking exposure. However, the potential for such a screening programme to reduce the overall burden of lung cancer mortality may be limited, because the majority of future lung cancer patients are not eligible for screening. Biomarkers have the potential to improve eligibility criteria for CT screening by providing information on risk that is not captured by an individual’s smoking history.

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Research design

The study, which was conducted in collaboration with the University of Texas MD Anderson Cancer Center, in Houston, USA, measured blood levels of four tumour-related protein biomarkers in pre-diagnostic blood samples from a cohort study in the USA to build a biomarker-based risk prediction tool. The performance of the risk prediction tool was then tested in pre-diagnostic blood samples from two large European cohort studies: the European Prospective Investigation into Cancer and Nutrition (EPIC) and the Northern Sweden Health and Disease Study (NSHDS).

“Avoiding smoking is the best way to reduce the risk of developing lung cancer, but among current and former smokers who are at high risk, early detection has a key role to play in further reducing deaths from this disease,” says IARC Director Dr Christopher Wild. “These promising laboratory biomarker results offer new opportunities to improve survival for patients with lung cancer.”

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The International Agency for Research on Cancer (IARC) is part of the World Health Organization. Its mission is to coordinate and conduct research on the causes of human cancer, the mechanisms of carcinogenesis, and to develop scientific strategies for cancer control. The Agency is involved in both epidemiological and laboratory research and disseminates scientific information through publications, meetings, courses, and fellowships. If you wish your name to be removed from our press release e-mailing list, please write to com@iarc.fr.