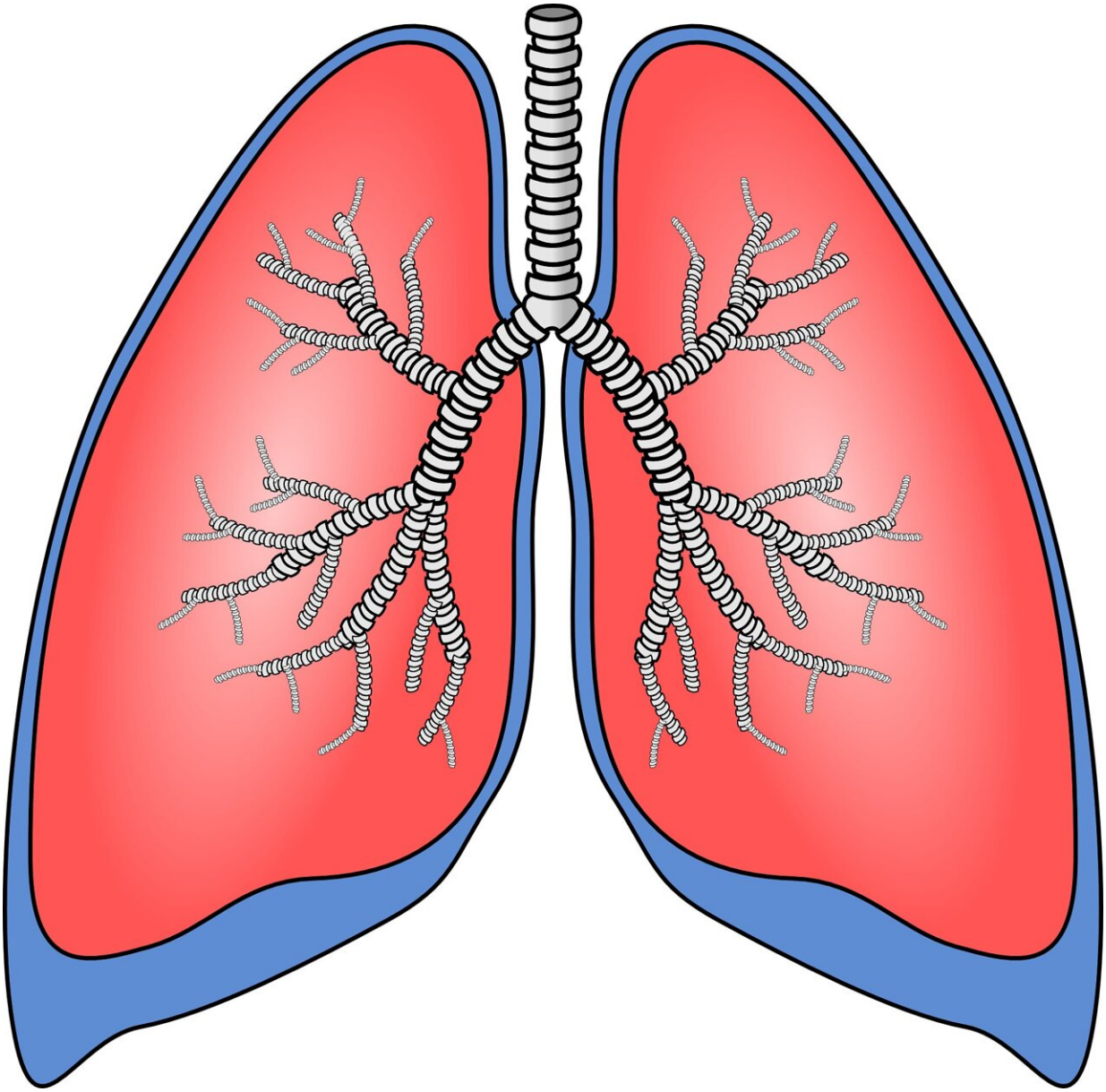
Epigenetic age and lung cancer risk in a prospective cohort study

February 16 2023



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Epigenetic age, a robust marker of biological aging, has been associated with obesity, low-grade inflammation and metabolic diseases. However, few studies have examined associations between different epigenetic age measures and risk of lung cancer, despite great interest in finding biomarkers to assist in risk stratification for lung cancer screening.

In a recent study published in *Aging*, researchers Dominique S. Michaud, Mei Chung, Naisi Zhao, Devin C. Koestler, Jiayun Lu, Elizabeth A. Platz, and Karl T. Kelsey from Tufts University, University of Kansas Medical Center, Johns Hopkins Bloomberg School of Public Health, The Sidney Kimmel Comprehensive Cancer Center at Johns Hopkins, and Brown University conducted a nested case-control analysis of 208 lung cancer cases and 208 matched controls with archived pre-diagnostic blood samples (from 1989).

The case-control study is nested in the CLUE II cohort study, a predominantly White cohort of men and women, based in Maryland, U.S..

"It is important to examine whether epigenetic age is associated with lung cancer risk across multiple prospective studies to determine its utility as a potential biomarker to be considered for risk stratification in the selection of high-risk individuals for lung cancer screening," write the researchers.

Prediagnostic blood samples were collected in 1989 (CLUE II study baseline) and stored at −70°C. DNA was extracted from buffy coat and DNA methylation levels were measured using Illumina MethylationEPIC BeadChip Arrays. Three epigenetic age acceleration (i.e., biological age

is greater than chronological age) measurements (Horvath, Hannum and PhenoAge) were examined in relation to lung cancer risk using conditional logistic regression.

The researchers did not observe associations between the three epigenetic age acceleration measurements and risk of lung cancer overall; however, inverse associations for the two Hannum age acceleration measures (intrinsic and extrinsic) were observed in men and among younger participants, but not in women or older participants. Additionally, they did not observe effect modification by time from blood draw to diagnosis.

The authors say, "Findings from this study do not support a positive association between three different biological age acceleration measures and risk of lung cancer. Additional studies are needed to address whether epigenetic age is associated with lung cancer in never smokers."

More information: Dominique S. Michaud et al, Epigenetic age and lung cancer risk in the CLUE II prospective cohort study, *Aging* (2023). DOI: 10.18632/aging.204501

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