
Precision prevention of lung cancer

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Project Description:

Lung cancer remains the leading cause of cancer mortality worldwide, with an increasing proportion of cases occurring among never-smokers and Asian populations who may not meet traditional screening criteria. Advancing precision prevention requires improved risk stratification that integrates environmental exposures, lifestyle factors, genetic susceptibility, and molecular biomarkers. Leveraging large population-based cohorts and international consortia with detailed exposure, genomic, and high-throughput biomarker data (e.g. metabolomics, proteomics), this research examines how multidimensional risk factors jointly influence lung cancer development and how highly correlated biological and environmental data can be modeled efficiently to improve risk prediction. The goal is to develop and validate risk-based approaches that inform targeted screening and prevention strategies in populations where current criteria may be insufficient.