Translating Laboratory Findings Towards Assessment of Tobacco-related Cancer Risk in Populations and Individuals

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Abstract

Traditional epidemiology studies of exposure and disease become much more powerful through the application of laboratory research data. Molecular epidemiology investigations assess individual risk using biomarkers for exposure, susceptibility and response. Genetically-determined acetylation polymorphisms have been associated with increased cancer risk in smokers, but the reports are inconsistent. Functional characterizations of the single nucleotide polymorphisms (SNPs), haplotypes and genotypes are necessary to understand functional relationships between genotype and phenotype.

The power of these types of laboratory research studies in the interpretation of individual risk will be illustrated by describing the genetic susceptibility of the acetylation polymorphism (catalyzed by N-acetyltransferase 2) in urinary bladder and breast cancer risk in tobacco smokers.