THE GENOTYPIC INFLUENCE ON CANCER PHENOTYPE

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Abstract: The contribution of the environment to the development of chronic disease has historically been documented. As early as 1775, scrotal and nasal cancers were observed among chimney sweepers in London, England by British physician, Percival Potts. His hypothesis was that these cancers were induced by cumulative environmental exposure to chimney soot as they worked. The discipline of cancer epidemiology has continued in the tradition of Dr. Potts. The purpose of this discipline has not been to prove a cause-effect relationship between exposure and development of disease but to identify the “common thread” of exposures. Today, cancer epidemiology incorporates various scientific disciplines (i.e., risk assessment, toxicology, cellular and molecular biology) to quantify the dose-response relationship between an individual and suspect environmental factor. With the completion of the Human Genome Project in 2002, we now know that individual genetic variability plays a significant role in modifying the effect of environmental exposures on disease development. Additionally, the utility of assessing the individual’s genetic variability is invaluable in estimating the degree of severity at time of diagnosis as well as the risk of metastasis and other complications. This presentation explores the relationship of gene-environment interactions in cancer from an environmental epidemiology and public health perspective.

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