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Translation of Laboratory Research Findings towards Cancer Risk Assessments from Environmental Chemicals

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Human epidemiological studies associating chemical exposures to cancer risk often are inconsistently validated across studies. Examples include the effect of smoking on cancer etiology other than the lung, such as urinary bladder and breast. Research findings from the laboratory have improved the understanding of arylamine carcinogen metabolism leading to improved design and interpretation of human molecular epidemiology investigations. Laboratory studies that infer and test biological plausibility, including cancer risks modified by differential metabolism of arylamine carcinogens in rapid and slow arylamine *N*-acetyltransferase (NAT2) acetylators, have been critical for investigating the role of smoking in the etiology of human cancers. These concepts will be explored with an example of a cancer in which the role of smoking has largely been validated (urinary bladder cancer) and an example where a consensus for the role of smoking remains to be achieved (breast cancer).

Biography:

Dr. Hein serves as Peter K. Knoefel Endowed Chair of Pharmacology, Professor and Chairman of the Department of Pharmacology & Toxicology, and Distinguished University Scholar at the University of Louisville (USA). His research program includes studies of the molecular epidemiology of cancer susceptibility, pharmacogenetics, genomics, personalized medicine, and functional genomics. He has coauthored over 240 peer-reviewed journal articles and book chapters, 75 published gene sequences, and over 600 abstracts. The publications have over 13,000 citations with an h-index 58. He has served as principal investigator/co-investigator/mentor on over 75 research grants and contracts totaling over $50 million dollars.