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Editorial:

RELEVANCE OF GENETIC DISPOSITION VERSUS ENVIRONMENTAL EXPOSURE FOR CANCER RISK: AN OLD CONTROVERSY REVISITED WITH NOVEL METHODS

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An old debate has been revisited using a novel technique (Schwender et al., 2012): is genetic predisposition or environmental exposure more relevant for cancer risk? In this context urinary bladder cancer represents a particularly well-studied example (Golka et al., 2012a, b; Roth et al., 2012; Ovsiannikov et al., 2012). The environmental influence on bladder cancer risk has been clearly documented for cigarette smoking and occupational exposure to aromatic amines and polycyclic aromatic hydrocarbons - both representing the most important factors (Golka et al., 2009; 2012a, b). Recently, several single nucleotide polymorphisms have also been identified that are associated with urinary bladder cancer risk, all of which have been confirmed in independent follow-up studies (Kiemeney et al., 2008, 2010; Rothman et al., 2010; Rafnar et al., 2011; Lehmann et al., 2010; Golka et al., 2011; Selinski et al., 2012a, b; Binder et al., 2012). In total 13 novel SNPs have been identified, as recently summarized (Selinski et al., 2012a, b).

Using a novel technique for interaction analysis Schwender et al. (2012) have now calculated an 'overall genetic risk' based on the interactions of the high risk alleles of recently identified genetic variants. The highest stable combination resulted in an odds ratio of 2.0, a ratio that is still lower than the odds ratio of cigarette smoking which was 3.28 for the current smokers of the study population. However, both odds ratios are still low compared to some of the worst cases of occupational exposure, for example an odds ratio of 5-200 has been reported for workers exposed to beta-naphtylamine, and 38-90 for 4-chloro-o-toluidine-exposed individuals. The study of Schwender et al. (2012) is of interest to all who interested in the direct comparison of environmental and genetic influences on cancer risk.

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