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Editorial:

CARCINOGENESIS IN TOXICOLOGICAL RESEARCH

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Current research in carcinogenesis is focussed on enzymes controlling reactive compounds and the maintenance of DNA integrity. An outstanding example is a review on epoxide hydrolases. known to be key enzymes in detoxification of carcinogenic epoxides (Decker et al., 2009). However, it has recently become clear that besides their function in xenobiotic metabolism, epoxide hydrolases also play a role in signal transduction and inflammatory control. A further highlight is a review on telomeres and the mechanisms that avoid the misinterpretation of chromosome ends as sites of DNA breaks. The table gives a brief overview of the key messages of recent studies in the field of carcinogenesis.

Table 1: Recent studies in carcinogenesis and human exposure to carcinogens

Key message	Reference
A c-myc reporter cell line was established that allowed flow-sorting of cells with weak (10 %) and strong (70 %) c-myc overexpression. This technique allows differentiation of biological consequences in relation to the intensity of c-myc levels.	Knudsen et al., 2009
Occupational exposure of workers to polycyclic aromatic hydrocarbons is associated with increased levels of 8-oxo-dGuo DNA adducts and DNA strand breaks in lymphocytes.	Marczynski et al., 2009
Urinary 3-hydroxybenzo[a]pyrene can be used as a biomarker of dermal exposure to benzo[a]pyrene. However, it should be considered that the ratio of excretion may be overestimated.	Payan et al., 2009
Epoxide hydrolases are key enzymes in xenobiotic metabolism catalyzing the hydrolysis of potentially carcinogenic epoxides. However, besides xenobiotic metabolism evidence accumulates that epoxide hydrolases are also involved in the metabolism of lipid derived epoxides playing a role in signal transduction, blood pressure control and inflammatory processes.	Decker et al., 2009 (review); Hengstler et al., 2009a (editorial)
Telomeres serve to prevent the mis-identification of chromosome ends as sites of DNA damage. This review focuses on the mechanisms eukaryotic cells have evolved to overcome this problem.	Liew and Norbury, 2009 (review); Hengstler et al., 2009b (editorial)
This review summarizes the anti-carcinogenic activities of polyphenolic compounds in tea.	Yang et al., 2009a (review) Hengstler et al., 2009c (editorial)
Exposure of male volunteers to 50 ppm toluene in an exposure chamber for 270 min does not reduce the nOGG1 repair activity.	Finkenwirth et al., 2009
$SnCl_2$ interferes with DNA repair systems shifting the balance from error-free to error-prone repair processes.	Viau et al., 2009

Table 1 (cont.): Recent studies in carcinogenesis and human exposure to carcinogens

Key message	Reference
A novel dual-label fluoroimmunoassay allows simple and fast simultaneous screening of the carcinogens aflatoxin B_1 and ochratoxin A.	Huang et al., 2009
The heterocyclic aromatic amine PhIP induces preneoplastic lesions in rat colon without preceding or accompanying inflammation.	Kühnel et al., 2009
Iso-GAMA was identified as a further human metabolite of acrylamide. This study presents the kinetics of iso-GAMA and other oxidative metabolites of acrylamide in human urine.	Hartmann et al., 2009
Bisphenol A has been suspected as a risk factor of breast cancer. However, no significant difference of bisphenol A blood levels between breast cancer cases and controls could be found in Korean women.	Yang et al., 2009b
A variant of intron 6 of GSTM3 is associated with prostate cancer risk.	Kesarwani et al., 2009
Piperonyl butoxide acts as a liver carcinogen by a threshold mechanism. The threshold dose is approximately 0.25 % piperonyl butoxide in the diet of rats.	Muguruma et al., 2009
Human urinary bladder epithelial cells seem to consist of two subtypes with inducible as well as non-inducible CYP1A1.	Plöttner et al., 2009
RasH2 mice are not susceptible to troglitazone in a two-stage hepatocarcinogenesis model.	Jin et al., 2009

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