

Editorial:

THE HUMAN BITUMEN STUDY

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Recently, the Human Bitumen Study has been finished (Schlüter, 2011). Including 500 workers from more than 80 construction sites it represents the world-wide largest study on adverse health effects caused by bitumen. The study answers a question that has been controversially discussed since decades: Bitumen exposed workers do not show higher levels of DNA damage than unexposed individuals. On the other hand bitumen workers showed irritative effects in the lower airways (Raulf-Heimsoth et al., 2011b). To give our readers an overview over the recent developments we summarized the most important results of the Human Bitumen Study in the table below.

Table 1: Key results from the Human Bitumen Study (reproduced with permission of the Archives of Toxicology; van Thriel and Marchan, 2012)

Key message	Reference
This article summarises the most important findings of the Human Bitumen Study which includes 500 workers from 80 construction sites. The results in a nutshell: Bitumen exposure did not cause genotoxicity but subchronic inflammation of the upper airways.	Raulf-Heimsoth et al., 2011a
Quantification of bitumen-derived matter in aerosols still remains a challenge and differences in sampling and analytical methods should be considered. PAH exposure for mastic asphalt workers was higher compared to construction sites without bitumen application. However, the exposure of coke-oven workers is at least one order of magnitude higher when compared to bitumen workers.	Breuer et al., 2011
Processing temperature of bitumen is critical for exposure. Therefore, reducing the processing temperature represents an efficient protective measure.	Spickenheuer et al., 2011
Urinary levels of PAHs are only of limited value when it comes to the biomonitoring of bitumen-exposed workers, because (i) the PAH content of bitumen is relatively low, (ii) cigarette smoking has a strong influence, (iii) additives are increasingly used in asphalt mixtures.	Pesch et al., 2011
Bitumen-exposed workers showed potentially (sub)chronic irritative inflammatory effects in the lower airways.	Raulf-Heimsoth et al., 2011b
DNA adducts and strand breaks in bitumen workers were within the range found in healthy individuals, although slightly higher in exposed workers compared to non-exposed controls. Overall, it is unlikely that bitumen exposure at the workplaces causes DNA damage.	Marczynski et al., 2011
Bitumen exposure did not cause a relevant increase in micronucleus frequencies in peripheral blood lymphocytes of workers.	Welge et al., 2011
The influence of 18 SNPs on urinary PAH metabolites was relatively weak, with the GSTM1 deletion and NAT2 and CYP1A1 associated variants showing borderline significant effects.	Rihs et al., 2011
Mastic asphalt application led to significantly higher bitumen vapour exposure than rolled asphalt application.	Raulf-Heimsoth et al., 2011c

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