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# METABOLISM AND EXCRETION OF POLYCYCLIC AROMATIC HYDROCARBONS IN RAT AND IN HUMAN

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## SUMMARY

Polycyclic aromatic hydrocarbons have shown to be an important class of environmental and occupational carcinogens. By balancing the carcinogenic potential PAH were found to predominantly contribute to the biological activity of environmental matter such as vehicle exhaust, used motor oil, and hard-coal combustion effuents. Due to the individual ratio of toxifying and detoxifying processes PAH-exposure measurements are not appropriate to be used for risk assessment without any further information on their metabolic fate. Accordingly, metabolite profiles of phenanthrene, pyrene, chrysene, benz(a)anthracene and fluoranthene have been recorded in both tar-pitch exposed Wistar rats and coke plant workers. The results show that metabolite profiles are invariant individual parameters which, however, vary from one individual to another. Significant differences with regard to the ratio of k-region and non-k-region hydroxylation of phenanthrene have been observed in a greater number of coke plant workers. This ratio might be helpful for risk assessment studies since it reflects the various cytochrome P450-dependent monooxygenase isoforms participating in the metabolism of PAH. Studies of this kind can only be carried out with substrates possessing several nonequivalent double bonds (phenanthrene, chrysene) whereas pyrene – commonly used for biomonitoring – does not satisfy this condition. The excretion rate (excretion versus exposure) seems to be an individual parameter.

*Key words:* regio-specific oxidation, risk assessment, biomonitoring, polycyclic aromatic hydrocarbons, coke plant workers

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