ABSTRACT

Cancer is nowadays one of the most serious diseases. Tumor development is a multistage process in which the effect of internal and external factors lead to failure of regulatory and defense mechanisms of the organism and to the accumulation of mutations which are generated by these organisms. Chemical carcinogens and also biological and physical factors can be regarded as the main external factors. Polycyclic aromatic hydrocarbons are large group of chemical carcinogens. One of them, benzo[a]pyrene is the most studied polycyclic aromatic hydrocarbon. Carcinogenic, mutagenic and teratogenic effects of benzo[a]pyrene had been shown on laboratory animals. Benzo[a]pyrene is considered as the main carcinogen in tobacco smoke and is connected with lung cancer development among smokers. Benzo[a]pyrene is metabolized in activation or detoxication pathways by enzymes of mixed function monooxygenase systeme of cytochromes P450. The most important enzymes involved in the activation of these compounds are CYP1A1 and CYP1B1 with cooperation of epoxide hydrolase. The reactive species generated in its activation pathway are able to form covalent adducts with DNA. The most important carcinogenic product of benzo[a]pyrene is benzo[a]pyrene-7,8-dihydrodiol-9,10-epoxide, which can caused irreversible ganges in molecules of DNA.

KEY WORDS

Benzo[a]pyrene, cytochrome P450, carcinogenesis polycyclic aromatic hydrocarbons, smoking

[In Czech]