This review discusses characteristics of the enzyme inducers, consequences of enzyme induction for the action of drugs, the presence of multiple monooxygenases in liver microsomes, the selective induction of microsomal monooxygenases, mechanisms of induction of microsomal enzymes, effects of drugs on electron transport systems in liver microsomes, enzyme induction in nonhepatic tissues, stimulatory effects of drugs on the metabolism of steroid hormones and other normal body constituents, enzyme induction in humans, and possible therapeutic applications of enzyme induction. [The SCI® indicates that this paper was cited 2019 times in the period 1967-1977.]

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Studies by H L Richardson and his associates in 1952 demonstrated that 3-methylcholanthrene—a potent skin carcinogen—increased the hepatocarcinogenicity of Vmethyl-4-dimethylaminoazobenzene. Additional research by James and Hizabeth Miller and their associates at the University of Wisconsin demonstrated that several polycyclic aromatic hydrocarbons increased the carcinogenicity of 3-methyl-4-dimethylaminoazobenzene and 2-acetylaminofluorene. While a graduate student with James and Hizabeth Miller from 1952 to 1958, I studied the stimulatory effect of polycyclic hydrocarbons on liver microsomal enzymes that metabolize aminoazo dyes to nonarc inogenic products. These studies helped explain why polycyclic hydrocarbons inhibited the carcinogenic action of aminoazo dyes. We also demonstrated that 3-methylcholanthrene and benzo(a)pyrene induced the synthesis of a liver microsomal enzyme system that hydroxylates benzo(a)pyrene.

1. Richardson H L, Stier A R & Borsos-Nachlnebel E. Liver tumor inhibition and adrenal histological responses in rats to which 3-methyl-4-dimethylaminoazobenzene and 20-methylcholanthrene were simultaneously administered. Cancer Res. 12:365-61, 1952.