A Liver Medium-term Bioassay (Ito Test) and a Multi-organ Carcinogenesis Bioassay in Rats for Detection of Chemopreventive Agents; Inhibitory Effects of Organosulfur Compounds

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Summary

A liver medium-term bioassay (Ito test) and a multi-organ carcinogenesis bioassay in rats have been developed as in vivo organ bioassays for detection of chemopreventive agents. 1) In the Ito test rats are given diethylnitrosamine (DEN), 200mg/kg b.w., i. p. and starting 2 weeks later are administered test chemicals for 6 weeks and then killed, all rats being subjected to 2/3 hepatectomy one week after the start of test chemical treatment. Both promoting and inhibitory effects can be detected in terms of numbers and areas of liver glutathione S-transferase placental from (GST-P) positive foci, as found for the series of organosulfur compounds illustrated here. 2) In the multi-organ carcinogenesis bioassay, rats are given DEN, N-methyl-N-nitrosourea, N-butyl-N-(4-hydroxybutyl) nitrosamine, N, N'-dimethylhydrazine and dihydroxy-di-N-propylnitrosamine during the first 4 weeks, followed by test chemicals for 24 weeks. The various organs are then examined with a whole-body approach. Compounds such as methyl propyl disulfide and propylene sulfide were found to demonstrate inhibitory effects on the development of GST-P-positive foci. Inhibitory potential for colon and renal carcinogenesis was also observed in rats treated with diallyl disulfide. Thus, the results indicate that the described systems can be reliably applied as medium-term bioassays for assessment of inhibitory potentials of test chemicals in unknown target sites.