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Inhibitory Effect of Chitosan Oligosaccharide on the Initiation of Carcinogenesis

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The effect of chitosan oligosaccharides (COS), COS I (1000<Mr<3000) and COS II (3000<Mr<5000), were examined on the initiation of carcinogenesis by measuring the inductions of quinone reductase, glutathione S-transferase and glutathione and benzo[a]pyrene-DNA adduct formation. COS I and COS II were potent inducers of quinone reductase activity in murine hepatoma Hepal1c7 cells. Glutathione S-transferase activity was increased about 1.5-fold with COS II in cultured murine hepatoma cells. In addition glutathione levels were slightly increased with COS I. At concentration of 1 mg/ml of COS I and COS II, the binding of ³H-benzo[a]pyrene metabolites to DNA of NCTC-clone 1469 cell was inhibited by 23.6 and 29.1%, respectively. These results suggest that chitosan oligosaccharide has a chemopreventive potential by inhibiting the initiation of carcinogenesis.