Genotoxicity of safrole oxide in HepG2 cells and in mice

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Abstract
Safrole oxide (SAFO) is an electrophilic metabolite of the carcinogen safrole, the main constituent of sassafras oil. There is little or no data available on the genotoxicity of SAFO in mammalian systems. We investigated the cytotoxicity and genotoxicity of SAFO by MTT assay, Comet assay and Micronucleus test in HepG2 human hepatoma cells in vitro and in FVB mice in vivo. SAFO exhibited a time- and dose-dependent cytotoxic effect in HepG2 cells. SAFO produced a marked increase in comet tail length and in the frequency of micronucleated binucleated cells at doses of 125 μM and higher. Furthermore, repeated intraperitoneal injections of SAFO to mice caused a significantly increase in mean comet tail length of peripheral blood leukocytes and in the frequency of micronucleated reticulocytes in a dose-dependent manner. Our present data have demonstrated for the first time that SAFO exhibited significant genotoxicity in human cells in vitro and in vivo.

Keywords: safrole oxide, COMET, micronucleus test, HepG2 cells, peripheral blood