

In Vitro DNA Damages of Diesel Exhaust Particle Extract

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Abstract

The present study investigated the DNA damages of diesel exhaust particle (DEP) using single cell gel electrophoresis. DEP(<2.5 μ m) was collected from diesel engine bus and dichloromethane extract was obtained. The organic extract of DEP revealed DNA damage itself in NIH3T3 cells. And it showed both oxidative and microsome mediated DNA damages. Oxidative DNA damages were found to be potent in polar fractions of DEP, but rat microsome mediated DNA damages were potent in nonpolar fractions of DEP. Vitamin C as an model antioxidant reduced DNA damage in endonuclease III treated comet assay. One of flavonoid, galangin as a CYP1A1 inhibitor reduced DNA damage in the presence of S-9 mixture. Our results show that DEP are genotoxic and a great source of oxidative stress, but antioxidants can significantly reduce oxidative DNA damages. And DEP may contain indirect mutagens which can be inhibited by CYP inhibitors.

Keywords : diesel exhaust particle, single cell gel electrophoresis, DNA damages, antioxidant, CYP1A1 inhibitor