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Lipid Peroxides and Glutathione Levels in Pooled Human Liver Microsomes (HLMs) Following Exposure to Quercetin

Abstract:

Oxidative stress is the imbalance between exposure to reactive oxygen species (ROS) and antioxidants. This imbalance has been implicated in tumorigenesis in some cells. We have previously reported on the effectiveness of quercetin (Q) and its antioxidant properties in several cell types following acute exposure. As to the effectiveness of exposure of cells to Q over longer incubation periods on lipid peroxides (LP) and the intracellular glutathione (GSH) levels in cells are limited and not conclusive. In this study, HLMs were cultured and exposed to several doses of Q to test if there is any correlation between LPs and GSH following exposure for 24, 48 and 72 hr. following the oxidative stress. HLMs were subjected to the Fenton's pathway, using 20 µM Fe^{2+} and 0.1 mM hydrogen peroxide (H_2O_2), and with or without Q at 0, 5, 10, 15, 20 and 25 for the said incubation times. Our findings indicate that LPs decreased significantly ($p<0.05$) with increases in Q concentration over time. Furthermore, GSH levels also increased in a dose- and time-dependent manner. The studies indicate that Q can reduce LPs through its extended antioxidant potential as well as the regeneration and/or preventing loses of intracellular GSH in HLMs over time. We report here our, novel findings on the mechanisms of action of Q probably through the induction of the cytochrome-P450 3A4 (CYP3A4) which we have observed and may relate to LPs and GSH levels in HLMs.

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