Effects of Hispidulin on Human HepG2 Hepatoma Cells

Scoparo, C. T.; Valdameri, G.; Barbosa, F.A.L.; Winnischofer, S. M. B.; Rocha, M. E. M.

Department of Biochemistry and Molecular Biology, UFPR, Curitiba, PR, Brazil.

Hepatocellular carcinoma (HCC) is the most common primary malignancy of the liver, with limited treatment options. Flavonoids are a group of polyphenolic compounds with many biological activities, including antitumor properties. Although antitumor effects of some flavones are already described in some types of tumors, the effects of hispidulin (5,7,4′- trihydroxy-6-methoxyflavone) on human HepG2 hepatoma cells have not yet been described. Our previous data showed that treatment of HepG2 cells with hispidulin (50 and 100 µmol/L) decreases cell viability in 24 and 45% and increases the ROS levels in 36 and 58% respectively. This effect was attenuated by co-treatment with the antioxidant N-acetylcysteine. Therefore, the aim of this study was to analyze the effects of hispidulin on reduced glutathione levels (GSH) (spectrophotometric analysis), cell cycle progression (flow cytometry) and antioxidant enzyme expression (PCR-Real Time). We showed that treatment of HepG2 cells with 50 and 100 µmol/L of hispidulin decrease the GSH levels in 43% and 52%, increase the percentage of cells into subG1 phase (69% and 93%) and decrease the catalase mRNA expression levels in 38 and 40%, respectively. Together, our results suggest that the mechanism by which hispidulin mediate increase in ROS levels, may be through decreasing the catalase expression and GSH levels, resulting in cell death.

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