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Differential apoptotic induction of gambogic acid, a novel anticancer natural product, on hepatoma cells and normal hepatocytes

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Abstract

Gambogic acid (GA) is the major active ingredient of gamboge, a brownish resin exuded from *Garcinia hanburryi* tree in Southeast Asia. In this study, we compared the different apoptotic induction of GA on human normal embryon hepatic L02 cells and human hepatoma SMMC-7721 cells by detecting growth inhibition, observing morphological changes, and the expressions of the relative apoptotic proteins (Bax, Bcl-2 and caspase-3). The results indicated that GA could selectively induce apoptosis of SMMC-7721 cells, while had relatively less effect on L02 cells. To illustrate the distinct selective antitumor mechanism of GA, we further study its distribution in cultured cells and in tumor-bearing mice. The results indicated that SMMC-7721 cells have higher GA binding activity than L02 cells. The retention time of GA in grafted tumor was longer

binding activity than L02 cells. The retention time of GA in grafted tumor was longer than in liver, renal and other organs. Collectively, the selective anticancer activity of GA could be due to its significant apoptotic inducing effects as well as its higher distribution and longer retention time in tumor cells compared to the normal cells. So GA might be a kind of highly effective anticancer drug candidate with low toxicity to normal tissue.

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Keywords

Gambogic acid; Apoptosis; Bcl-2; Bax; Caspase-3

[1] They contributed equally to this article.

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