Cuphiin D1, the macrocyclic hydrolyzable tannin induced apoptosis in HL-60 cell line

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Abstract

Cuphiin D1 (CD1), a new macrocyclic hydrolyzable tannin isolated from Cuphea hyssopifolia, has been shown to exert antitumor activity both in vitro and in vivo. In this study, we explored the mechanism of the CD1-induced antitumor effect on human promyelocytic leukemia (HL-60) cells. The results showed that CD1 induced cytotoxicity in HL-60 cells and the IC50 was 16 microM after 36 h treatment. HL-60 cells treated with CD1 for 36 h decreased the uptake of [3H]-labeled thymidine, uridine and leucine in a dose dependent manner. Electron micrographs demonstrated that HL-60 cells treated with 16 microM CD1 for 36 h exhibited chromatin condensation, indicating the apoptosis occurrence. Flow cytometric analysis demonstrated the presence of apoptotic cells with low DNA content, a decrease of cell population at G2/M phase, and a concomitant increase of cell population at G1 phase. CD1 also caused DNA fragmentation and inhibited Bcl-2 expression in the HL-60 cells. These results suggest that the inhibition of Bcl-2 expression in HL-60 cell might account for the mechanism of CD1-induced apoptosis.