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Effect of curcumin on the proliferation, apoptosis, migration, and invasion of human melanoma A375 cells

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ABSTRACT. Malignant melanoma is a melanocytic tumor with a high potential of invasion and metastasis. Curcumin is extracted from *Curcuma longa* L.; curcumin has anti-tumor efficacy in multiple systemic malignancies. Here, we investigated the effect of curcumin on A375 human melanoma cells. A375 cells were cultivated, passaged, and treated with different concentrations of curcumin. We observed the cellular morphology and determined the migration, invasion, proliferation, and apoptosis of A375 cells *in vitro*. Our results showed that curcumin induced a significant change in the morphology of A375 cells. Compared to the control group, the groups treated with curcumin showed significantly wider scratches, and the number of A375 cells significantly decreased in the 12.5, 25, and 50 μM curcumin groups ($P < 0.05$ or < 0.01). The rates of proliferation inhibition in the 5 curcumin groups were 19.38 ± 3.57%, 35.56 ± 4.37%, 63.98 ± 5.95%, 86.38 ± 3.91%, and 95.56 ± 3.15%. The half-maximal inhibitory concentration of curcumin at 48 h was 10.05 μM. The rates of apoptosis

in 6.25 and 12.5 μM curcumin groups were significantly higher ($P < 0.05$), phosphorylation levels of JAK-2 and STAT-3 in 10 and 20 μM curcumin groups were significantly lower ($P < 0.05$), and Bcl-2 protein expression in 1, 2.5, 5, 10, and 20 curcumin groups was significantly lower ($P < 0.05$) than that in the control group. In conclusion, curcumin has antiproliferative and proapoptotic activities on A375 cells, the mechanism of which may be related to the inhibition of JAK-2/STAT-3 signaling pathway.

Key words: Curcumin; Melanoma; Proliferation; Apoptosis; Migration; Invasion

