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Curcumin-induced HDAC inhibition and attenuation of medulloblastoma growth in vitro and in vivo.

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Abstract

ABSTRACT:

BACKGROUND: Medulloblastoma is the most common brain tumor in children, and its prognosis is worse than for many other common pediatric cancers. Survivors undergoing treatment suffer from serious therapy-related side effects. Thus, it is imperative to identify safer, effective treatments for medulloblastoma. In this study we evaluated the anti-cancer potential of curcumin in medulloblastoma by testing its ability to induce apoptosis and inhibit tumor growth in vitro and in vivo using established medulloblastoma models.

METHODS: Using cultured medulloblastoma cells, tumor xenografts, and the Smo/Smo transgenic medulloblastoma mouse model, the antitumor effects of curcumin were tested in vitro and in vivo.

RESULTS: Curcumin induced apoptosis and cell cycle arrest at the G2/M phase in medulloblastoma cells. These effects were accompanied by reduced histone deacetylase (HDAC) 4 expression and activity and increased tubulin acetylation, ultimately leading to mitotic catastrophe. In in vivo medulloblastoma xenografts, curcumin reduced tumor growth and significantly increased survival in the Smo/Smo transgenic medulloblastoma mouse model.

CONCLUSIONS: The in vitro and in vivo data suggest that curcumin has the potential to be developed as a therapeutic agent for medulloblastoma.

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