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Resveratrol as an antitumor agent for glioblastoma multiforme: Targeting resistance and promoting apoptotic cell deaths

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Abstract

Glioblastoma multiforme (GBM) is one of the most aggressive brain and spinal cord tumors. Despite the significant development in application of antitumor drugs, no significant increases have been observed in the survival rates of patients with GBM, as GBM cells acquire resistance to conventional anticancer therapeutic agents. Multiple studies have revealed that PI3K/Akt, MAPK, Nanog, STAT 3, and Wnt signaling pathways are involved in GBM progression and invasion. Besides, biological processes such as anti-apoptosis, autophagy, angiogenesis, and stemness promote GBM malignancy. Resveratrol (RESV) is a non-flavonoid polyphenol with high antitumor activity, the potential of which, regulating signaling pathways involved in cancer malignancy, have been demonstrated by many studies. Herein, we present the potential of RESV in both single and combination therapy- targeting various signaling pathways- which induce apoptotic cell death, re-sensitize cancer cells to radiotherapy, and induce chemo-sensitizing effects to eventually inhibit GBM progression.

Keywords: Apoptosis; Autophagy; Drug resistance; Glioblastoma; Resveratrol.

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