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1: [Childs Nerv Syst.](#) 2009 Feb 19. [Epub ahead of print]



Evaluation of radiotherapy effect in resveratrol-treated medulloblastoma cancer stem-like cells.

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OBJECTIVES: Resveratrol (RV), a natural polyphenol derived from red wine, recently showed the potential of anticancer and radiosensitizing effects. A recent study has suggested that the cancer stem cells (CSCs) may reflect the clinical refractory malignancy of brain tumors, including medulloblastoma (MB). The aim of the present study is to investigate the possible role of RV in radiosensitivity of MB cells and MB-associated CSCs. **MATERIALS AND METHODS:** MB-associated CSCs were isolated and cultured by serum-free medium with basic fibroblast growth factor (bFGF) and epidermal growth factor (EGF). The parental MB cells and MB-CSCs were treated with RV in different concentrations and assessed for cell viability. The treatment includes RV alone, radiation alone, or radiation combined with RV. **RESULTS:** MB-CSCs selected by serum-free medium with bFGF and EGF can form 3D spheroid formation and display enhanced self-renewal and highly co-expressed "stem cell" genes (Oct-4, Nanog, Nestin, and Musashi-1) as well as antiapoptotic genes (Bcl-2 and Bcl-xL). These MB-CSCs showed significant resistance to radiotherapy as compared to the parental MB cells. Importantly, 100 μ M RV could effectively inhibit the proliferation of MB-CSCs and significantly enhance the radiosensitivity in RV-treated MB-CSCs. **CONCLUSIONS:** Our data suggest that RV can effectively inhibit the proliferation and tumorigenicity of MB-CSCs and significantly synergistically enhance radiosensitivity in RV-treated MB-CSCs.

PMID: 19225784 [PubMed - as supplied by publisher]
