

The Antitumor Effects of MRx102: Novel, Potent, and Synergistic

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Purpose/Objective(s)

Long-term control of cancer depends on synergistic combinations of local and systemic therapy. Radiation is known to have synergistic and additive effects with a number of agents, although its effects on normal tissue are sometimes amplified. The inhibition of angiogenesis should enhance the control of primary tumors, aid in radiation control, and impair the ability of disseminated tumor cells to produce metastases. Thus, we studied the antitumor effect of MRx102 (a synthetic derivative of triptolide isolated from *Tripterygium wilfordii*).

Materials/Methods

Different types of cancer cells (4T1 breast cancer cells, B16 melanoma cells, Du145 prostate cancer cells, and Hep G2 heptoma cells) were treated with MRx102 alone or in combination with radiation, 5-Fu, or cisplatin at different doses. The data were assessed and calculated for the combination index (CI) and dose-reduction index (DRI) values. MRx102 was also added to 6-day old chick chorioallantoic membranes (CAM). On days 10-11, the CAM was harvested, imaged, and analyzed. JC-1 staining was used to determine the effect of MRx102 on mitochondrial potential.

Results

The data showed that: (1) MRx102 potently killed a wide variety of cancer cells, including 4T1 breast cancer, B16 melanoma, Du145 prostate cancer, and Hep G2 heptoma cells; (2) MRx102 had a synergistic effect with radiation, as demonstrated by the CI 1; (3) MRx102 had a similar synergistic effects with 5-Fu and cisplatin; (4) MRx102 inhibited angiogenesis in the CAM system, as evidenced by the reduced vessel area, vessel length, and number of branches; and (5) MRx102 induced apoptosis, which correlated with mitochondrial potential, as shown in JC-1 staining.

Conclusion

MRx102 has the potential to be developed into a new antitumor agent that has a synergistic effect