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The Effects of Rhodiola Crenulata Extract on Proliferation and Differentiation in Glioblastoma Multiforme

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Et al.

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ABSTRACT

Purpose:

Purpose of the study was to evaluate the effects of *rhodiola crenulata* plant extract on glioblastoma in vitro.

Methods:

U-87MG glioblastoma multiforme cell line was utilized for evaluation in this study. Cells were treated with 100ug/ml or 200ug/ml of *rhodiola crenulata* and compared to ethanol vehicle control. Proliferation was measured at 24, 48, 72, and 96 hours after treatment utilizing an MTS proliferation assay. To further assess proliferation a clonogenicity assay was conducted. These cells were treated with ethanol vehicle control, 100ug/ml of rhodiola, radiation, or combined rhodiola/radiation treatment. To evaluate differentiation the expression of glial fibrillary acidic protein (GFAP), a protein marker of differentiation, was assessed with immunocytochemistry.

Results:

Effects on proliferation were initially noted at 48hours after treatment and observed through the 96-hour period. The effects on proliferation were noted in both treatment groups. At 96-hours after treatment significant difference was noted between the 100ug/ml of rhodiola and control group ($p=0.0065$) and significant difference noted between the 200ug/ml of rhodiola and control group ($p=0.0006$). Cell clonogenicity was reduced in the cells treated with 100ug/ml of rhodiola. The decreased number of colonies was significant when comparing the radiation treated cells with 100ug/ml rhodiola treated cells ($p=0.0030$). GFAP was overexpressed in the rhodiola treatment group when compared to expression in the control group (Figure 1).

Conclusion:

Rhodiola crenulata extract effectively decreases proliferation and increases differentiation of glioblastoma cells in vitro. Further work is required to fully understand the extent and full effects *rhodiola crenulata* has glioblastoma cells.

Figure 1: A. Rhodiola treated cells B. Ethanol Control Group