ANTHOCYANIN TREATMENT SELECTIVELY REDUCES CELL VIABILITY IN Glioblastoma cell line

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Glioblastoma multiforme (GBM) is the worst and most common brain tumor characterized by cell heterogeneity, resistance to apoptosis, extensive angiogenesis, infiltration capability in brain tissue, high proliferative rate and genomic instability. Despite efforts to develop new therapies, effective agents are not available, making the treatment limited to surgery, followed by radio- and chemotherapy. Therefore, the development of new agents to treat the GBM is highly needed. Recent epidemiological and dietary intervention studies have suggested that diet-derived anthocyanin may play a beneficial role by preventing or inhibiting tumorigenesis. The aim of the present investigation was to evaluate the selective in vitro cytotoxic effect of a combination of anthocyanins from grape skins in a rat glioma cell line (C6) and in primary astrocyte cultures.

Cells were treated with a mixture of anthocyanins (1-100 µg/mL) and analysis were performed 24 h after treatment. Cell viability was assessed by MTT assay and cell morphology was analyzed by optical microscopy. Data were analyzed by ANOVA followed by Tukey post-hoc test. Values were considered significantly different from control when $P \leq 0.05$. Exposure of cells to the mixture of anthocyanins reduced cell viability in a dose-dependent manner after 24 h of treatment: 1 µg/mL (14%), 10 µg/mL (20%), 30 µg/mL (22%), 50 µg/mL (29%) and 100 µg/ ml (31%). Among the main changes in cell morphology, a decrease in cell density was evident when compared to the control cells indicating a possible antiproliferative activity of anthocyanins in C6 glioma line. In addition, anthocyanins did not exhibited toxicity to astrocytes, a model of normal cells, indicating a selective citotoxic effect against tumor cells.

The present study shows that a mixture of anthocyanins was effective to decrease glioma cell viability without affecting normal astrocytes, suggesting the potential of anthocyanins for cancer treatment.

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Key words
anthocyanins, glioma, cell viability.