

Inhibiting the Proliferation of Patient-Derived Glioblastoma Multiforme (GBM) Cells and U-87 MG Cell Line Using Leaf Extract of *Bacopa monnieri*

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Glioblastoma multiforme (GBM) is the most common and aggressive type of primary brain tumor. Patients with GBM have a median survival of 15 months. Current treatments for GBM are quite limited and research into developing novel therapeutics is warranted. *Bacopa monnieri*, a species of herbaceous perennials, has shown to exhibit numerous beneficial effects. Phytochemical analysis of *Bacopa* has revealed high concentrations of compounds known as terpenoids, which have anti-tumorigenic properties. Considering these properties of terpenoids, it was hypothesized that *Bacopa* may inhibit the proliferation of GBM cells in vitro. The objective was to prepare leaf extract of *Bacopa monnieri* and assess its effect on GBM cells. Methanolic extract of *Bacopa* leaves was applied to patient-derived GBM cells & U-87 MG cell line in-vitro. Tested extract concentrations ranged from 4 to 300 µg/mL. After 72 hrs of exposure, GBM cell proliferation was analyzed through a colorimetric WST-1 tetrazolium reduction assay. The results revealed that cell proliferation was inhibited by the *Bacopa* extract in patient-derived GBM cells and U-87 MG cell line. The IC₅₀ (50% inhibitory dose) range was between 11 and 33 µg/mL for patient-derived GBM and between 33 and 100 µg/mL for U-87 MG. Data analysis revealed statistically-significant F-values and P-values for both cell lines. In conclusion, this study presents that *Bacopa monnieri* does indeed inhibit GBM proliferation, a finding which has never been previously reported or published. This study presents a potential novel approach to the treatment of GBM. If the bioactive compound(s) responsible for the observed inhibitive phenomenon can be identified and safely tested, *Bacopa monnieri* has the potential to be used as an adjuvant therapy for GBM.

Awards Won:

American Statistical Association: Second Award of \$1,000