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News & Comments

# Goniothalamin GTN would be Beneficial for Glioblastoma GBM Treatment

*Zhiqin Zheng*

The deadliest form of brain cancer, glioblastoma (GBM), accounts for between 50 and 60% of all cerebral glioma and is extremely invasive. Many recognized bioactive substances with potent cytotoxic characteristics have been used as anticancer treatments. The genus Goniothalamus contains most of the bioactive styryl-lactone Goniothalamin (GTN), which has strong antiproliferative properties. It was isolated from the family Annonaceae. Additionally, GTN has been exposed to its apoptosis-inducing and anticancer properties in several malignancies. The class of protein kinases known as Mitogen-Activated Protein Kinases (MAPKs), which include ERK1/2, JNKs, and p38 MAPKs, has been linked to the emergence and progression of GBM. This study looked at whether p38 MAPK phosphorylation-mediated apoptosis is a mechanism by which goniothalamin slows the growth of glioblastoma.

Merck in Germany provided goniothalamin, FBS, antibiotics, and other biochemical. The antibodies were purchased from Labome in the USA and were directed against p38 MAPK, JNK, ERK, Bax, Bcl-2, cyclin B1, CDK1, p21, and GAPDH. The Peking Union Cell Resource Centre (Beijing, China) provided the GBM human cancer cell line U251. By analysing the SPSS 18.0 program for multiple comparisons through one-way ANOVA followed by Dunnett's test, the results were presented as Mean SD.

The CCK-8 was used to assess the vitality of the GBM cancer cells to study the effect of GTN on U251 cell proliferation. The live/dead test was used to examine the cell viability of the control and GTN (25 and 30 M). When GTN was applied to U-251 cells, the expression of the phosphorylated p38 MAPK protein increased, but ERK and JNK showed no change in comparison to control glioma cells. Despite years of the academic and clinical study, GBM remains the most lethal brain cancer that affects the central nervous system. According to reports, increased GBM-related morbidity and mortality are linked to several cancer-causing signalling disorders with extremely high cell viability.

The bioactive chemicals that come from plants have special effects that may be able to stop the spread of many malignancies. They stop the growth of cancer cells by a variety of mechanisms, including the induction of apoptosis, autophagy, and different stages of cancer cell cycle arrest. According to reports, GTN may have therapeutic promise for the treatment of cancer-based on prior in vitro work. Additionally, a recent study has suggested that GTN may be able to distinguish between normal and cancerous cells with only a minor difference in action.

The research showed that GTN affected human GBM cells by increasing apoptosis and suppressing cell

viability. The anticancer mechanism of GTN on these U251 cells may be elaborated by the apoptosis and cell cycle detention generated by GTN along with p38 MAPK activation. Thus, GTN has a potent natural anti-cancer drug for human GBM treatment.

JOURNAL REFERENCE

Li, R., L. Zhao, S. Devanesan, M.K. Maruthamuthu and Y. Yin, 2022. Goniothalamin suppressed glioblastoma cell proliferation through p38 MAPK phosphorylation mediated apoptosis. Int. J. Pharmacol., 18: 746-752.

KEYWORDS

Goniothalamin, glioblastoma, U-251 cells, apoptosis, proliferation, p38 MAPK, CDK1