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Non-thermal plasma is promising potential novel therapy for the treatment of living tissues for biological and medical purposes including apoptosis and inhibit tumor progression that acts by generating reactive oxygen species (ROS) and reactive nitrogen species (RNS). It is postulated that ROS and RNS playing a major role in the soft jet plasma cancer therapy. Previous research works verified that jet plasma could induce apoptosis of various cancer cells, in particular indicative the selective cytotoxicity of cancer cells over normal cells. Glioblastoma multiforme (GBM) is the most frequent, highly recurrent, and rapidly progressing type of astrocytic brain tumor in adults with a five years survival rate of ~ 4%. We investigated the use of soft jet plasma as a novel therapy to combine together with or alternate to conventional therapeutic methods. In this study, we designate the effects of a non-thermal air soft jet plasma on the U87 brain cancer cell line, including the dose (time) dependent manner. The results of this study shows that the soft jet plasma inhibits cell proliferation efficiently and induces apoptosis in U87 cells. The current findings reveal that soft jet plasma is a potent cytotoxic effect against brain cancer cells and its cytotoxicity is mediated through induction of apoptosis and cell cycle arrest. Finally, our analysis results recommend that the potential employment of plasma jets as a novel therapy for cancer therapy.

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