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A DIETARY GANODERMA LUCIDUM-BASED SUPPLEMENTATION AS A CHEMOTHERAPEUTIC ADJUVANT THERAPY IN GLIOBLASTOMA

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The current standard oncotherapy for brain cancer is limited by several adverse side effects. Complementary and Integrative Medicine (CIM) was adopted as an innovative approach in oncological care, often associated with better response in cancer treatment. Promising sources for potential drug discovery in oncotherapy are compounds coming from phyto and mycotherapy. Thus, aiming at exploring the potential contribution of these therapies with those in clinical use and to improve the living conditions of glioblastoma patients, in the present study we exploited the effect of a novel phyto-mycotherapic supplement, namely "Ganostile", in U251 human glioblastoma cell line, at a dose range which mimics the oral supplementation in humans (about 1.5 g/day). The supplement contains Ganoderma lucidum, Eleutherococcus senticosus, Echinacea purpurea, Astragalus membranaceus, all known to stimulate the immune system. A battery of complementary techniques, i.e. MTS assay, cytofluorimetry and immunofluorescence, were adopted to evaluate cell cycle and viability, oxidative stress pathway, and cytoplasmic organelles function as uptake/cell metabolism marker. After 48hr-continuous exposure to "Ganostile", a drastic decrease in cell viability was measured, further confirmed by cytofluorimetric data showing a bulk cell number blocked in the G2/M phase. The observed effects induced on proteins involved in metabolic function and cell homeostasis regulation could support the supplement direct effect on the immune system modulation through beta-glucan contents and on intracellular mechanisms. It was also evaluated its effect combined with compounds currently used in oncotherapy, such as Temozolomide and Platinum based drugs. Our data suggest a preliminary effect of the supplement on cell cycle. Therefore, our data support the use of "Ganostile" in integrative oncology protocols as a promising adjuvant able to amplify conventional drug effects and reducing resistance mechanisms often observed in brain tumours, e.g. glioblastoma multiforme.