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ANTITUMOR AROMA THERAPY WITH LEMONGRASS ESSENTIAL OIL FOR GLIOBLASTOMA

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Aromatic essential oils have been used in cancer treatment to enhance immunity, induce sedation, and reduce the side effects of chemotherapy. Recently, essential oils have been reported to have anti-tumor effects. We have been investigating anti-tumor aroma of essential oils as a novel treatment for glioblastoma and have found that hiba essential oil has a proliferation inhibitory effect. In this study, we investigated the antitumor effect of lemongrass essential oil for glioblastoma and its antitumor aromatherapy. Human glioblastoma cells (U87, T98G) and mouse brain tumor cells (RSV-M) were used. Lemongrass essential oil was added to each tumor cell line, and growth inhibition was observed in all cell lines. In addition, lemon grass essential oil showed growth inhibition effect when the tumor cells were separated from the oil, as was the case with direct administration, suggesting that the lemongrass essential oil components that evaporated acted on tumor cells in the surrounding area. The antitumor component of lemongrass essential oil was isolated and identified as citral, an antitumor factor, by gas chromatography. Analysis of the effects of citral showed that it strongly inhibited MARK4 activity and growth in three cell lines. The mechanism revealed that citral decreased the phosphorylation of Tau protein. MARK4 is highly expressed in glioblastoma and has been reported to be involved in cell proliferation. This study suggests a potential mechanism for citral to inhibit tumor cell proliferation via MARK4 in malignant gliomas. Citral is a volatile monoterpene and may exert its antitumor effect by evaporation diffusion. Lemongrass essential oil contains citral, which shows antitumor effects, and is expected to be applied to a new glioblastoma therapy using "aroma".