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Cannabinoids as antitumor agents for glioma treatment - Potential novel routes of administration

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Cannabinoids are a class of chemical compounds exerting anti-inflammatory, anti-proliferative, anti-invasive, anti-metastatic and pro-apoptotic effects in different cancer types including gliomas, both *in vitro* and *in vivo*, after local or systemic administration. Δ9-Tetrahydrocannabinol (Δ9-THC), cannabidiol and cannabinol are the most prevalent natural cannabinoids. Gliomas, the most common primary brain tumors, are highly resistant to available therapeutic approaches, including radiation and chemotherapy. Despite various preparations permitting oral administration of Δ9-THC, their systemic administration has several limitations, partly due to their lipophilicity. Local administration of Δ9-THC reduced the size of tumors generated by intracranial inoculation of glioma cells in rats, without affecting healthy brain tissue. Clinical experimental therapies administered intracranially Δ9-THC via catheter in the resection cavity of glioblastomas and this led to tumor growth inhibition. High concentrations of cannabinoids can easily be delivered by stereotaxic injection (a routine approach for neurosurgeons) directly into human brain tumor masses, thus augmenting their efficacy, while keeping systemic side effects to a minimum. Cannabidiol- and Δ9-THC-loaded microparticles have been used as an alternative delivery system for long-term cannabinoid administration in a rodent model of glioma. This method of microencapsulation facilitated a sustained, prolonged release of the two cannabinoids and reduced tumour growth by enhancing apoptosis and decreasing cell proliferation and angiogenesis. In conclusion, various routes of cannabinoids administration might prove useful in the future treatment of glioma patients.

Biography

Zogopoulos Panagiotis is a resident of Neurosurgery at the General Hospital of Nikaia-Piraeus "Agios Panteleimon", Athens, Greece. His ongoing research is in the field of drugs and their interaction with human brain and cerebral vessels. Several of his papers have been published in reputed peer-review journals and he has presented various researches in international conferences.

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