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Mechanisms Involved in the Therapeutic Effect of Cannabinoid Compounds on Gliomas: A Review with Experimental Approach

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Abstract

Introduction: Brain tumors have high morbidity and mortality rates, accounting for 1.4% of all cancers. Gliomas are the most common primary brain tumors in adults. Currently, several therapeutic approaches are used; however, they are associated with side effects that affect patients' quality of life. Therefore, further studies are needed to develop novel therapeutic protocols with a more favorable side effect profile. In this context, cannabinoid compounds may serve as potential alternatives.

Objective: This study aimed to review the key enzymatic targets involved in glioma pathophysiology and evaluate the potential interaction of these targets with four cannabinoid derivatives through molecular docking simulations.

Methods: Molecular docking simulations were performed using four cannabinoid compounds and six molecular targets associated with glioma pathophysiology.

Results: Encouraging interactions between the selected enzymes and glioma-related targets were observed, suggesting their potential activity through these pathways. In particular, cannabigerol showed promising interactions with epidermal growth factor receptors and phosphatidylinositol 3-kinase, while Δ -9-tetrahydrocannabinol showed remarkable interactions with telomerase reverse transcriptase.

Conclusion: The evaluated compounds exhibited favorable interactions with the analyzed enzymatic targets, thus representing potential candidates for further in vitro and in vivo studies.

Keywords: Gliomas. Cannabinoid compounds. Antitumoral. Chemoinformatics. Review. Experimental..

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