Molecular Mechanisms and Strategies for Inducing Neuronal Differentiation in Glioblastoma Cells

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PMID: 39880036   DOI: 10.1089/cell.2024.0087

Abstract

Glioblastoma multiforme (GBM) is a highly invasive brain tumor, and traditional treatments combining surgery with radiochemotherapy have limited effects, with tumor recurrence being almost inevitable. Given the lack of proliferative capacity in neurons, inducing terminal differentiation of GBM cells or glioma stem cells (GSCs) into neuron-like cells has emerged as a promising strategy. This approach aims to suppress their proliferation and self-renewal capabilities through differentiation. This review summarizes the methods involved in recent research on the neuronal differentiation of GBM cells or GSCs, including the regulation of transcription factors, signaling pathways, miRNA, and the use of small molecule drugs, among various strategies. It also outlines the interconnections between the mechanisms studied, hoping to provide ideas for exploring new therapeutic avenues for GBM and the development of differentiation-inducing drugs for GBM.

Keywords: differentiation; glioblastoma; molecule; neuron; pathway; target.

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