

## ABSTRACT

J Drug Target. 2022 Mar 14:1-31. doi: 10.1080/1061186X.2022.2047191. Online ahead of print.

Non-coding RNAs Enhance the Apoptosis Efficacy of Therapeutic Agents Used for the Treatment of Glioblastoma Multiform.

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The treatment of brain tumors remains a challenge despite progress in surgical techniques and radio/chemotherapy. The therapeutic outcomes for glioblastoma multiform (GBM) have not been satisfactory and result in median overall survival (12-18 months). GBM displays both intra- and inter-tumor heterogeneity, causing resistance and eventually tumor recurrence. In this review, we address molecular events responsible for the dysregulation of apoptosis and introduce newly discovered non-coding RNAs (MicroRNAs and Long non-coding RNAs) that regulate tumor growth and enhance therapeutic outcomes in GBM. The combinatory use of MicroRNAs and Long non-coding RNAs with chemotherapeutic compounds, as well as the induction of suicide genes, provide an innovative therapeutic approach for the management of GBM. The understanding of GBM pathogenesis, intrinsic drug resistance mechanism, and targetable oncogenic pathways could lead to establishing novel approaches and techniques to combat GBM.

DOI: 10.1080/1061186X.2022.2047191

PMID: 35282758