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miRNAs role in glioblastoma pathogenesis and targeted therapy: Signaling pathways interplay

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Abstract

High mortality and morbidity rates and variable clinical behavior are hallmarks of glioblastoma (GBM), the most common and aggressive primary malignant brain tumor. Patients with GBM often have a dismal outlook, even after undergoing surgery, postoperative radiation, and chemotherapy, which has fueled the search for specific targets to provide new insights into the development of contemporary therapies. The ability of microRNAs (miRNAs/miRs) to posttranscriptionally regulate the expression of various genes and silence many target genes involved in cell proliferation, cell cycle, apoptosis, invasion, angiogenesis, stem cell behavior and chemo- and radiotherapy resistance makes them promising candidates as prognostic biomarkers and therapeutic targets or factors to advance GBM therapeutics. Hence, this review is like a crash course in GBM and how miRNAs related to GBM. Here, we will outline the miRNAs whose role in the development of GBM has been established by recent in vitro or in vivo research. Moreover, we will provide a summary of the state of knowledge regarding oncomiRs and tumor suppressor (TS) miRNAs in relation to GBM with an emphasis on their potential applications as prognostic biomarkers and therapeutic targets.

Keywords: Glioblastoma; MicroRNAs; Prognostic biomarker; Therapeutic target.

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