Circular RNAs

Circular RNAs (circRNAs) are a novel category of non-coding RNAs, and they have been identified to participate in glioma tumorigenesis.

They are highly stable, circularized Long non-coding RNAs. circRNAs are conserved across species and appear to be specifically enriched in the nervous system.

Many circRNAs are expressed in a tissue- and developmental-stage-specific manner, reveal a striking regulation of circRNAs during neuronal development, and detect their presence at synaptic sites. The exact functions of circRNAs remain poorly understood, but evidence from analysis of some circRNA molecules suggests that they could substantially contribute to the regulation of gene expression, particularly in architecturally complex and polarized cells such as neurons. Emerging evidence also indicates that circRNAs are involved in the development and progression of various neurological disorders [1].

see Circular RNAs in glioblastoma.

A research desired to explore the functions and mechanism of a circRNA, circ_0079593, on regulating glioma progression. Quantitative real-time polymerase chain reaction (qRT-PCR) was carried out to measure the relative expression of circ_0079593, which was upregulated in matched cancerous tissues from 60 patients and four cell lines of glioma. A higher level of circ_0079593 in glioma specimens was linked to larger tumor size, higher WHO grade, and worse survival rate for patients with glioma. Moreover, circ_0079593 can be deemed as an independent prognostic predictor for glioma patients analyzed by multivariate method. Cell counting kit-8, flow cytometric, wound healing, and transwell experiments were used to evaluate cell growth, apoptosis, migration, and invasion influenced by circ_0079593 knockdown/overexpression. Exogenous downregulation of circ_0079593 expression significantly suppressed glioma cell proliferation by increasing cell apoptosis in vitro, and retarded the migratory and invasive potential. Ectopic expressed circ_0079593 could induce the opposite effects. Mechanistically, bioinformatics analysis, qRT-PCR, and dual-luciferase reporter assays showed that microRNA 182 (miR-182) and miR-433 could be sponged and negatively regulated by circ_0079593. Further, rescue assays demonstrated that the biological functions of circ_0079593 are dependent on its inhibition of miR-182 and miR-433. Collectively, the present work indicates that circ_0079593 may be used as an effective prognostic marker and therapeutic target for glioma [2].

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2)
Qu Y, Zhu J, Liu J, Qi L. Circular RNA circ_0079593 indicates a poor prognosis and facilitates cell growth and invasion by sponging miR-182 and miR-433 in glioma. J Cell Biochem. 2019 May 30. doi: 10.1002/jcb.29103. [Epub ahead of print] PubMed PMID: 31148222.