Circular RNAs in glioblastoma

Knockdown of circular RNAs CEP128 suppresses cell proliferation and improves the cytotoxicity efficacy of temozolomide in glioma cells by regulating miR-145-5p, suggesting that circular RNA CEP128 might be a promising target for overcoming the resistance of glioma cells to temozolomide [1].

Zhu et al. identified a profile of dysregulated Circular RNAs in glioblastoma (GBM). Bioinformatics analysis showed that dysregulated circRNAs might be associated with tumorigenesis and development of GBM. In addition, circBRAF could severe as a biomarker for predicting pathological grade and prognosis in glioma [2].

Yang et al. performed Circular RNAs deep sequencing by using 10 pathologically diagnosed glioblastoma samples and their paired adjacent normal brain tissues. Northern blotting, Sanger sequencing, antibody, and liquid chromatograph Tandem Mass Spectrometer were used to confirm the existence of circ-FBXW7 and its encoded protein in in two cell lines. Lentivirus-transfected stable U251 and U373 cells were used to assess the biological functions of the novel protein invitro and invivo (five mice per group). Clinical implications of circ-FBXW7 were assessed in 38 pathologically diagnosed glioblastoma samples and their paired periphery normal brain tissues by using quantitative polymerase chain reaction (two-sided log-rank test).

Circ-FBXW7 is abundantly expressed in the normal human brain (reads per kilobase per million mapped reads [RPKM] = 9.31). The spanning junction open reading frame in circ-FBXW7 driven by internal ribosome entry site encodes a novel 21-kDa protein, which we termed FBXW7-185aa. Upregulation of FBXW7-185aa in cancer cells inhibited proliferation and cell cycle acceleration, while knockdown of FBXW7-185aa promoted malignant phenotypes invitro and invivo. FBXW7-185aa reduced the half-life of c-Myc by antagonizing USP28-induced c-Myc stabilization. Moreover, circ-FBXW7 and FBXW7-185aa levels were reduced in glioblastoma clinical samples compared with their paired tumor-adjacent tissues ($P < .001$). Circ-FBXW7 expression positively associated with glioblastoma patient overall survival ($P = .03$).

Endogenous circRNA encodes a functional protein in human cells, and circ-FBXW7 and FBXW7-185aa have potential prognostic implications in brain cancer [3].

1)
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2)
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