The occurrence of an inherent or acquired resistance to temozolomide (TMZ) is a major burden for patients suffering from glioma.

Studies have demonstrated that microRNAs play an important role in the regulation of tumor properties in cancers. However, whether miR-497 contributes to glioma resistance to chemotherapy is not fully understood.

Zhu et al., showed that the expression of miR-497 was markedly up-regulated in TMZ-resistant glioma cells; high miR-497 expression level was associated with TMZ-resistant phenotype of glioma cells. The down-regulation of miR-497 in glioma cells enhanced the apoptosis-induction and growth inhibition effects of TMZ both in vitro and in vivo, whereas promotion of miR-497 increased the chemosensitization of glioma cells to TMZ. The increased level of miR-497 in TMZ-resistant glioma cells was concurrent with the up-regulation of insulin-like growth factor 1 receptor (IGF1R)/insulin receptor substrate 1 (IRS1) pathway-related proteins, that is, IGF1R, IRS1, mammalian target of rapamycin (mTOR), and Bcl-2. In addition, the knockdown of mTOR and Bcl-2 reduced the tolerance of glioma cells to TMZ. Our results demonstrated that overexpression of miR-497 is significantly correlated with TMZ resistance in glioma cells by regulating the IGF1R/IRS1 pathway. Therefore, miR-497 may be used as a new target for treatment of chemotherapy-resistant glioma [1].

1)
Zhu D, Tu M, Zeng B, Cai L, Zheng W, Su Z, Yu Z. Up-regulation of miR-497 confers resistance to temozolomide in human glioma cells by targeting mTOR/Bcl-2. Cancer Med. 2017 Jan 8. doi: 10.1002/cam4.987. [Epub ahead of print] PubMed PMID: 28064447.