Accumulating evidence demonstrates that certain microRNAs play critical roles in epileptogenesis. Previous studies found microRNA (miR)-129-2-3p was induced in patients with refractory temporal lobe epilepsy (TLE).

By bioinformatics, Wang et al. predicted miR-129-2-3p may target the gene GABRA1 encoding the GABA type A receptor subunit alpha 1. Luciferase assay was used to investigate the regulation of miR-129-2-3p on GABRA1 3'UTR. The dynamic expression of miR-129-2-3p and GABRA1 mRNA and protein levels were measured in primary hippocampal neurons and a rat kainic acid (KA)-induced seizure model by quantitative reverse transcription-polymerase chain reaction (qPCR), Western blotting, and immunostaining. MiR-129-2-3p agomir and antagomir were utilized to explore their role in determining GABRA1 expression. The effects of targeting miR-129-2-3p and GABRA1 on epilepsy were assessed by electroencephalography (EEG) and immunostaining.

Luciferase assay, qPCR, and Western blot results suggested GABRA1 as a direct target of miR-129-2-3p. MiR-129-2-3p level was significantly upregulated, whereas GABRA1 expression downregulated in KA-treated rat primary hippocampal neurons and KA-induced seizure model. In vivo knockdown of miR-129-2-3p by antagomir alleviated the seizure-like EEG findings in accordance with the upregulation of GABRA1. Furthermore, the seizure-suppressing effect of the antagomir was partly GABRA1 dependent.

The results suggested GABRA1 as a target of miR-129-2-3p in rat primary hippocampal neurons and a rat kainic acid (KA) seizure model. Silencing of miR-129-2-3p exerted a seizure-suppressing effect in rats. MiR-129-2-3p/GABRA1 pathway may represent a potential target for the prevention and treatment of refractory epilepsy ¹.

Wang et al. validated that miR-139-5p affected glioma malignant biological behavior via targeting gamma-aminobutyric acid A receptor alpha 1(GABRA1) through rescue experiments. Low miR-139-5p expression was correlated with survival probability and World Health Organization (WHO) grade. MiR-139-5p overexpression inhibited cell proliferation, migration, and invasion of glioma in vitro. GABRA1 was identified as a functional downstream target of miR-139-5p. Decreased GABRA1 expression was related to similar biological roles as miR-139-5p overexpression while upregulation of GABRA1 effectively reversed the inhibition effects of miR-139-5p. These results demonstrate a novel axis for miR-139-5p/GABRA1 in glioma progression and provide potential prognostic predictors and therapeutic target for glioma patients ².

1)

Wang GY, Luan ZL, Che NW, Yan DB, Sun XW, Zhang C, Yin J. Inhibition of microRNA-129-2-3p protects against refractory temporal lobe epilepsy by regulating GABRA1. Brain Behav. 2021 May 24:e02195. doi: 10.1002/brb3.2195. Epub ahead of print. PMID: 34029007.

Wang L, Liu Y, Yu Z, Gong J, Deng Z, Ren N, Zhong Z, Cai H, Tang Z, Cheng H, Chen S, He Z. Mir-139-5p inhibits glioma cell proliferation and progression by targeting GABRA1. J Transl Med. 2021 May 17;19(1):213. doi: 10.1186/s12967-021-02880-9. PMID: 34001135; PMCID: PMC8130534. From: https://neurosurgerywiki.com/wiki/ - **Neurosurgery Wiki**

Permanent link: https://neurosurgerywiki.com/wiki/doku.php?id=gabra1



Last update: 2024/06/07 02:52