RIO

The RIO (right open reading frame) protein kinases include RIOK1, RIOK2 and RIOK3. Emerging evidence has suggested an important role of RIO kinases in cancer cell proliferation, apoptosis, migration and invasion. However, the expression profile and specific roles of RIOK3 are largely unknown during glioma progression. In the current study, quantitative real-time PCR, Western blot, and immunohistochemical analysis showed that RIOK3 was upregulated in glioma tissues. Available database analysis revealed that higher levels of RIOK3 were associated with poorer survival outcome in glioma patients. Flow cytometry, CCK8 and EdU assays showed that downregulation of RIOK3 arrested cell cycle progression and inhibited glioma cell proliferation. Wound healing, transwell and gelatin zymography assays revealed that silencing RIOK3 decreased glioma cell migration and invasion. Furthermore, the downregulation of RIOK3 significantly decreased the activity of AKT/mTOR signaling and induced apoptosis in glioma cells. Overexpression of RIOK3 showed the opposite effects on glioma cell proliferation, migration, invasion and the AKT/mTOR pathway. These results indicate that high RIOK3 levels in gliomas appear to contribute to the growth and expansion of this cancer, and may thus serve as a novel therapeutic target [1)].

1)
Zhang T, Ji D, Wang P, Dong L, Jin L, Shi H, Liu X, Meng Q, Yu R, Gao S. The atypical protein kinase RIOK3 contributes to glioma cell proliferation/survival, migration/invasion and the AKT/mTOR signaling pathway. Cancer Lett. 2017 Dec 9. pii: S0304-3835(17)30782-6. doi: 10.1016/j.canlet.2017.12.010. [Epub ahead of print] PubMed PMID: 29233656.