Studies have revealed that neurons can promote glioma growth through activity-dependent secretion of neurotrophins, especially neuroligin-3. It has therefore been suggested that blocking neuron-derived neurotrophins may serve as a therapeutic intervention for gliomas. CA11 and CA10 are secreted synaptic proteins which function as neurexin ligands, and the gene encoding CA11 is part of a gene signature associated with radiotherapy and prognosis in gliomas. Thus, Tao et al., hypothesized that CA11/CA10 might participate in the neuronal activity-dependent regulation of glioma growth. In this study, they report that CA11 secreted by depolarized cultured neurons within conditioned medium (CM) inhibited the growth of glioma cell lines. CM from depolarized neurons inhibited CA11 expression in glioma cell lines via the Akt signaling pathway. Consistently, CA11 expression was also reduced in clinical glioma samples and negatively associated with high histological grade. Low CA11 expression of gliomas was associated with short survival in four independent datasets (REMBRANDT, TCGA LGG, GSE4271, and GSE42669). CA11 knock-down promoted cell growth, clone formation, and migration, inhibited apoptosis, and increased tumor size in xenografted nude mice. Similarly, CA10 and CA10 secreted by depolarized cultured neurons also inhibited the growth of glioma cell lines. Low CA10 expression was associated with short survival in REMBRANDT, TCGA LGG and GSE4271 datasets. Our results suggest that CA11 and CA10 negatively regulate neuronal activity-dependent glioma growth and inhibit glioma aggression. Thus, CA11/CA10 may represent a potential therapeutic target for the treatment of gliomas [1].

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Tao B, Ling Y, Zhang Y, Li S, Zhou P, Wang X, Li B, Zhong J, Zhang W, Xu C, Shi J, Wang L, Zhang W, Li S. CA10 and CA11 negatively regulate neuronal activity-dependent growth of gliomas. Mol Oncol. 2019 Jan 12. doi: 10.1002/1878-0261.12445. [Epub ahead of print] PubMed PMID: 30636076.