

## Novel Anti-microRNA Strategies for Glioblastoma Treatment without Cognitive Side Effects

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Treatments for glioblastoma multiforme (GBM) and other brain tumors produce long-term cognitive dysfunction. Explanations for this decline often include a treatment that blocks proliferation of neural progenitor cells (NPCs) in the hippocampus and the peri-ventricular zones and/or damaging mature neurons (MNs) in the hippocampus, which plays a critical role in memory and learning. Therefore, we hypothesized that inhibitor(s) of glioblastoma cell (GBC)-specific molecules that are under-expressed in NPCs or MNs might block proliferation of GBCs (i.e. glioblastoma growth) without harming NPCs or MNs. Accordingly we performed microRNA (miRNA), mRNA and protein expression profiles in GBCs, NPCs and MNs. Our data demonstrated that many transcripts (miRNAs, and mRNAs) were differentially expressed in GBCs compared to both NPCs and MNs; the changes of protein expression were consistent with those of mRNA expression with a few exceptions. Decreased expression of selected GBC specific miRNAs (e.g., miR-298, miR-9, miR-330) was associated with increased expression of their putative oncogene mRNA targets (e.g., Anxa1, Skap2, Tgfb1, Pdgfrb, Ckdn2c) in cell proliferation pathways. In addition, over expression of GBC specific miRNAs (e.g., miR-10b, miR196b, miR-196c, miR-211) was associated with decreased expression of their putative neuronal differentiation mRNA targets (e.g., Il1rap1, Nfasc, Unc5a, Slit1, Robo1, Nrp1) in axon guidance/ tumor suppressor pathways. Inhibition of miR-10b, which was highly expressed in GBCs compared to both NPCs and MNs, blocked the *in vitro* proliferation of GBCs without affecting NPC and MN survival. This provides a model for development of treatments that target GBCs that do not affect NPCs and MNs.

### Biography

DaZhi Liu has completed his Ph.D from Shanghai Institute of Materia Medica. After the postdoctoral studies, he becomes a professional researcher in University of California at Davis. He has published more than 25 papers in reputed journals and serving as an editorial board member of the Journal of Cytology & Histology.