Mutational activation of BRAF (BRAF^{V600E}) is found in 10-67% of pediatric gliomas (depending on histopathologic subclassification) and drives aberrant MAPK signaling independently of upstream cues. BRAF^{V600E} targeted monotherapy displays efficacy in pre-clinical models of glioma, however xenograft tumors adapt rapidly and escape from the growth-inhibitory effects of BRAF-targeted therapy. Here, we show that intrinsic resistance to a BRAF^{V600E} specific inhibitor stems, in part, from feedback activation of EGFR and downstream signaling pathways. BRAF^{V600E} inhibition suppresses MAPK signaling, which in turn downregulates the EGFR phosphatase PTPN9, resulting in sustained EGFR phosphorylation and enhanced EGFR activity. We further demonstrated that overexpression of PTPN9 reduces EGFR phosphorylation and cooperates with BRAF^{V600E} inhibitor PLX4720 to suppress MAPK and Akt signaling, resulting in decreased glioma cell viability. Moreover, pharmacologic inhibition of EGFR combined with inhibition of BRAF^{V600E} to reduce growth of glioma cell lines and orthotopic glioma xenograft by decreasing tumor cell proliferation while increasing apoptosis, with resultant significant extension of animal subject survival. Our data support clinical evaluation of BRAF^{V600E} and EGFR targeted therapy in treating BRAF^{V600E} glioma.