

ABSTRACT

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Cellular Conversations in Glioblastoma Progression, Diagnosis and Treatment.

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Glioblastoma (GBM) is the most frequent malignancy among primary brain tumors in adults and one of the worst 5-year survival rates (< 7%) among all human cancers. Till now, treatments that target particular cell or intracellular metabolism have not improved patients' survival. GBM recruits healthy brain cells and subverts their processes to create a microenvironment that contributes to supporting tumor progression. This microenvironment encompasses a complex network in which malignant cells interact with each other and with normal and immune cells to promote tumor proliferation, angiogenesis, metastasis, immune suppression, and treatment resistance. Communication can be direct via cell-to-cell contact, mainly through adhesion molecules, tunneling nanotubes, gap junctions, or indirect by conventional paracrine signaling by cytokine, neurotransmitter, and extracellular vesicles. Understanding these communication routes could open up new avenues for the treatment of this lethal tumor. Hence, therapeutic approaches based on glioma cells' communication have recently drawn attention. This review summarizes recent findings on the crosstalk between glioblastoma cells and their tumor microenvironment, and the impact of this conversation on glioblastoma progression. We also discuss the mechanism of communication of glioma cells and their importance as therapeutic targets and diagnostic and prognostic biomarkers. Overall, understanding the biological mechanism of specific interactions in the tumor microenvironment may help in predicting patient prognosis and developing novel therapeutic strategies to target GBM.

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