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# Metabolic partitioning in the brain and its hijacking by glioblastoma

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## Abstract

The different cell types in the brain have highly specialized roles with unique metabolic requirements. Normal brain function requires the coordinated partitioning of metabolic pathways between these cells, such as in the neuron-astrocyte glutamate-glutamine cycle. An emerging theme in glioblastoma (GBM) biology is that malignant cells integrate into or "hijack" brain metabolism, co-opting neurons and glia for the supply of nutrients and recycling of waste products. Moreover, GBM cells communicate via signaling metabolites in the tumor microenvironment to promote tumor growth and induce immune suppression. Recent findings in this field point toward new therapeutic strategies to target the metabolic exchange processes that fuel tumorigenesis and suppress the anticancer immune response in GBM. Here, we provide an overview of the intercellular division of metabolic labor that occurs in both the normal brain and the GBM tumor microenvironment and then discuss the implications of these interactions for GBM therapy.

**Keywords:** IDH mutation; brain metabolism; cancer metabolism; glioblastoma; glioma; glioma therapy; immune suppression; tumor microenvironment.

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