

Biological Pathways in Glioma [PI3K/AKT/mTOR Pathway](#):

Promotes cell growth, proliferation, and survival. Frequently hyperactivated due to PTEN loss or PIK3CA mutations. RAS/MAPK Pathway:

Stimulates cell cycle progression and invasion. JAK/STAT3 Pathway:

Drives inflammation, immune evasion, and stemness in glioma cells. Notch and Wnt Signaling:

Regulate glioma stem cell maintenance and therapy resistance. Metabolic Reprogramming:

Warburg effect: Preferential glycolysis even in oxygen-rich conditions. Increased lipid metabolism and glutamine dependence.

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