CXCR4 mediates the proliferation of glioblastoma progenitor cells

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Abstract

Increasing evidence points to a fundamental role for cancer stem cells (CSC) in the initiation and propagation of many tumors. As such, in the context of glioblastoma multiforme (GBM), the development of treatment strategies specifically targeted towards CSC-like populations may hold significant therapeutic promise. To this end, we now report that the cell surface chemokine receptor,

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CXCR4, a known mediator of cancer cell proliferation and invasion, is overexpressed in primary glioblastoma progenitor cells versus corresponding differentiated tumor cells. Furthermore, administration of CXCL12, the only known ligand for CXCR4, stimulates a specific and significant proliferative response in progenitors but not differentiated tumor cells. Taken together, these results implicate an important role for the CXCR4 signaling mechanism in glioma CSC biology and point to the therapeutic potential of targeting this pathway in patients with GBM.

**Keywords:** Brain tumor(s); Glioma(s); Cancer stem cell(s); CXCR4

**Abbreviations:** GBM, glioblastoma multiforme; GDS, glioma-derived spheres; CSC, cancer stem cells

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