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[Oncogene](#). 2004 Dec 16;23(58):9392-400.

Isolation of cancer stem cells from adult glioblastoma multiforme.

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Glioblastoma multiforme (GBM) is the most common adult primary brain tumor and is comprised of a heterogeneous population of cells. It is unclear which cells within the tumor mass are responsible for tumor initiation and maintenance. In this study, we report that brain tumor stem cells can be identified from adult GBMs. These tumor stem cells form neurospheres, possess the capacity for self-renewal, express genes associated with neural stem cells (NSCs), generate daughter cells of different phenotypes from one mother cell, and differentiate into the phenotypically diverse populations of cells similar to those present in the initial GBM. Having a distinguishing feature from normal NSCs, these tumor stem cells can reform spheres even after the induction of differentiation. Furthermore, only these tumor stem cells were able to form tumors and generate both neurons and glial cells after *in vivo* implantation into nude mice. The identification of tumor stem cells within adult GBM may represent a major step forward in understanding the origin and maintenance of GBM and lead to the identification and testing of new therapeutic targets.

PMID: 15558011 [PubMed - indexed for MEDLINE]

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