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Cell, Tumor, and Stem Cell Biology

IQGAP1 Protein Specifies Amplifying Cancer Cells in Glioblastoma Multiforme

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The accurate identification and thorough characterization of tumorigenic cells in glioblastomas are essential to enhance our understanding of their malignant behavior and for the design of strategies that target this important cell population. We report here that, in rat brain, the scaffolding protein IQGAP1 is a marker of brain nestin$^+$ amplifying neural progenitor cells. In a rat model of glioma, IQGAP1 also characterizes a subpopulation of nestin$^+$ amplifying tumor cells in glioblastoma-like tumors but not in tumors with oligodendroglioma features. We next confirmed that IQGAP1 represents a new marker that may help to discriminate human glioblastoma from oligodendrogliomas. In human glioblastoma exclusively, IQGAP1 specifies a

subpopulation of amplifying nestin^{+} cancer cells. Neoplastic IQGAP1^{+} cells from glioblastoma can be expanded in culture and possess all the characteristics of cancer stem-like progenitors. The similarities between amplifying neural progenitors and glioblastoma amplifying cancer cells may have significant implications for understanding the biology of glioblastoma. (Cancer Res 2006; 66(18): 9074-82)