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Brain Tumor Stem-Like Cells Identified by Neural Stem Cell Marker CD15.

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In recent years, a small number of cells that have stem cell properties were identified in human gliomas called brain tumor stem cells (BTSCs), which were thought to mainly contribute to the initiation and development of gliomas and could be identified by the surface marker CD133. However, recent studies indicated that the expression of CD133 might be regulated by environmental conditions such as hypoxia and that there might be CD133(-) BTSCs. Genetic mouse models demonstrated that some gliomas originated from transformed neural stem cells (NSCs). Therefore, we investigated the expression of CD15, a surface marker for NSCs, in tumor spheres derived from astrocytoma and ependymoma. CD15(+) cells isolated from these tumor spheres had properties of BTSCs including self-renewal, multidifferentiation, and the ability to recapitulate the phenocopy of primary tumors. CD15 exhibited stable expression in long-term cultured tumor spheres, which sustained BTSCs properties, whereas CD133 expression decreased significantly in late passages. Furthermore, CD15(+) CD133(-) cells isolated from early or late passages of tumor spheres showed similar characteristics of BTSCs. Examination of glioma samples by immunohistochemistry showed that CD15 was expressed in a subset of human brain tumors. Therefore, CD15 can be used as a marker of stem-like cells derived from brain tumors that might contain CD133(-) BTSCs.

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