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### Transcriptional profiles of CD133+ and CD133- glioblastoma-derived cancer stem cell lines suggest different cells of origin.

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Glioblastoma multiforme (GBM) is paradigmatic for the investigation of cancer stem cells (CSC) in solid tumors. Growing evidence suggests that different types of CSC lead to the formation of GBM. This has prompted the present comparison of gene expression profiles between 17 GBM CSC lines and their different putative founder cells. Using a newly derived 24-gene signature, we can now distinguish two subgroups of GBM: Type I CSC lines display "proneural" signature genes and resemble fetal neural stem cell (fNSC) lines, whereas type II CSC lines show "mesenchymal" transcriptional profiles similar to adult NSC (aNSC) lines. Phenotypically, type I CSC lines are CD133 positive and grow as neurospheres. Type II CSC lines, in contrast, display (semi-)adherent growth and lack CD133 expression. Molecular differences between type I and type II CSC lines include the expression of extracellular matrix molecules and the transcriptional activity of the WNT and the transforming growth factor-beta/bone morphogenetic protein signaling pathways. Importantly, these characteristics were not affected by induced adherence on laminin. Comparing CSC lines with their putative cells of origin, we observed greatly increased proliferation and impaired differentiation capacity in both types of CSC lines but no cancer-associated activation of otherwise silent signaling pathways. Thus, our data suggest that the heterogeneous tumor entity GBM may derive from cells that have preserved or acquired properties of either fNSC or aNSC but lost the corresponding differentiation potential. Moreover, we propose a gene signature that enables the subclassification of GBM according to their putative cells of origin.

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