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Medulloblastoma stem cells.

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Medulloblastoma and other embryonal brain tumors are similar in appearance and differentiation potential to neural stem and progenitor cells. Expression studies performed using human tumor samples, as well as the analysis of murine transgenic models, suggest that both multipotent cerebellar stem cells and lineage-restricted progenitors of the external germinal layer can be transformed into medulloblastoma by genetic alterations. These molecular changes frequently involve constitutive activation of signaling pathways such as Wnt, Hedgehog, and Notch, which play a key role in non-neoplastic neural stem cells. Pharmacologic blockade of the Hedgehog and Notch pathways suppresses the growth of medulloblastoma in culture and in vivo and may prove effective in targeting the small cancer stem-cell subpopulation required for tumor initiation and long-term propagation.

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