Development and cancer of the cerebellum.

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Abstract

Medulloblastoma (MB) is the most common malignant pediatric brain tumor and is thought to arise from genetic anomalies in developmental pathways required for the normal maturation of the cerebellar cortex, notably developmental pathways for granule cell progenitor (GCP) neurogenesis. Over the past decade, a wide range of studies have identified genes and their regulators within signaling pathways, as well as noncoding RNAs, that have crucial roles in both normal cerebellar development and pathogenesis. These include the Notch, Wnt/β-catenin, bone morphogenetic proteins (Bmp) and Sonic Hedgehog (Shh) pathways. In this review, we highlight the function of these pathways in the growth of the cerebellum and the formation of MB. A better understanding of the developmental origins of these tumors will have significant implications for enhancing the treatment of this important childhood cancer.

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