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Roles and interactions of tumor microenvironment components in medulloblastoma with implications for novel therapeutics

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Abstract

Medulloblastomas, the most common malignant pediatric brain tumors, can be classified into the wingless, sonic hedgehog (SHH), group 3, and group 4 subgroups. Among them, the SHH subgroup with the TP53 mutation and group 3 generally present with the worst patient outcomes due to their high rates of recurrence and metastasis. A novel and effective treatment for refractory medulloblastomas is urgently needed. To date, the tumor microenvironment (TME) has been shown to influence tumor growth, recurrence, and metastasis through immunosuppression, angiogenesis, and chronic inflammation. Treatments targeting TME components have emerged as promising approaches to the treatment of solid tumors. In this review, we summarize progress in research on medulloblastoma microenvironment components and their interactions. We also discuss challenges and future research directions for TME-targeting medulloblastoma therapy.

Keywords: extracellular matrix; immune cells; medulloblastoma; tumor microenvironment; tumor-associated astrocytes; vasculature.

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