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Rethinking pediatric gliomas as developmental brain abnormalities.

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Abstract

The neurofibromatosis type 1 (NF1) tumor predisposition syndrome provides an illustrative example of brain tumor formation and growth in which a permissive microenvironment (stroma) is required for the expansion and maintenance of the neoplastic cells. In this chapter, we review the experimental evidence that supports the emerging concept that brain tumors are dynamic ecosystems where interactions between non-neoplastic and neoplastic cell types dictate where and when gliomas (astrocytomas) form and grow. The notion that brain tumors require a confluence of supportive stromal cell types and signals, susceptible preneoplastic/neoplastic cells, and genomic influences allows researchers and clinicians to develop strategies that effectively disrupt these critical relationships in a targeted and developmentally appropriate fashion.

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