

Article

PDGFR α -Positive B Cells Are Neural Stem Cells in the Adult SVZ that Form Glioma-like Growths in Response to Increased PDGF Signaling

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Summary

Neurons and oligodendrocytes are produced in the adult brain subventricular zone (SVZ) from neural stem cells (B cells), which express GFAP and have morphological properties of astrocytes. We report here on the identification B cells expressing the PDGFR α in the adult SVZ. Specifically labeled PDGFR α expressing B cells in vivo generate neurons and oligodendrocytes. Conditional ablation of PDGFR α in a subpopulation of postnatal stem cells showed that this receptor is required for oligodendrogenesis, but not neurogenesis. Infusion of PDGF alone was sufficient to arrest neuroblast production and induce SVZ B cell proliferation contributing to the generation of large hyperplasias with some features of gliomas. The work demonstrates that PDGFR α signaling

occurs early in the adult stem cell lineage and may help regulate the balance between oligodendrocyte and neuron production. Excessive PDGF activation in the SVZ in stem cells is sufficient to induce hallmarks associated with early stages of tumor formation.

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