

Spatiotemporally different origins of NG2 progenitors produce cortical interneurons versus glia in the mammalian forebrain.

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Public Summary:

The studies on the exact lineage composition of NG2 expressing progenitors in the forebrain have been controversial. A number of studies have revealed the heterogeneous nature of postnatal NG2 cells. However, NG2 cells found in embryonic dates are far less understood. Our study indicates that early NG2 progenitors from a ventral origin (i.e., before embryonic day 16.5) tangentially migrate out of the medial ganglionic eminence and give rise to interneurons in deep layers of the dorsal cerebral cortex. The majority of myelinating oligodendrocytes found in both cortical gray and white matters are, in contrast, derived from NG2 progenitors with a neonatal subventricular zone origin. Our lineage tracing data reflect the heterogeneous nature of NG2 progenitor populations and define the relationship between lineage divergence and spatiotemporal origins. Beyond the typical lineage tracing studies of NG2+ cells, by costaining with lineage-specific markers, our study addresses the origins of heterogeneity and its implications in the differentiation potentials of NG2+ progenitors.

Scientific Abstract:

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