Expression of the murine transcription factor SOX3 during embryonic and adult neurogenesis

ABSTRACT

Previous studies have shown that Sox3 is expressed in nascent neuroprogenitor cells and is functionally required in mammals for development of the dorsal telencephalon and hypothalamus. However, Sox3 expression during embryonic and adult neurogenesis has not been examined in detail. Using a SOX3-specific antibody, we show that murine SOX3 expression is maintained throughout telencephalic neurogenesis and is restricted to progenitor cells with neuroepithelial and radial glial morphologies. We also demonstrate that SOX3 is expressed within the adult neurogenic regions and is coexpressed extensively with the neural stem cell marker SOX2 indicating that it is a lifelong marker of neuroprogenitor cells. In contrast to the telencephalon, Sox3 expression within the developing hypothalamus is upregulated in developing neurons and is maintained in a subset of differentiated hypothalamic cells through to adulthood. Together, these data show that Sox3 regulation is region-specific, consistent with it playing distinct biological roles in the dorsal telencephalon and hypothalamus.

Keyword: Sox3; SoxB1; Central nervous system; Neural progenitors; Dorsal telencephalon; Adult neurogenesis; Ventral diencephalon; Hypothalamus