Foxp1 Regulates Neural Stem Cell Self-Renewal and Bias Toward Deep Layer Cortical Fates.

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Public Summary:
The laminar architecture of the mammalian neocortex depends on the orderly generation of distinct neuronal subtypes by apical radial glia (aRG) during embryogenesis. Here, we identify critical roles for the autism risk gene Foxp1 in maintaining aRG identity and gating the temporal competency for deep-layer neurogenesis. Early in development, aRG express high levels of Foxp1 mRNA and protein, which promote self-renewing cell divisions and deep-layer neuron production. Foxp1 levels subsequently decline during the transition to superficial-layer neurogenesis. Sustained Foxp1 expression impedes this transition, preserving a population of cells with aRG identity throughout development and extending the early neurogenic period into postnatal life. FOXP1 expression is further associated with the initial formation and expansion of basal RG (bRG) during human corticogenesis and can promote the formation of cells exhibiting characteristics of bRG when misexpressed in the mouse cortex. Together, these findings reveal broad functions for Foxp1 in cortical neurogenesis.

Scientific Abstract:
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