



Early Patterning of the Cortical Primordium

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Abstract:

The cerebral cortex arises from a simple sheet of neuroepithelial tissue in the embryo. How this sheet is patterned to produce multiple cortical structures in a reliable and reproducible manner is a question of both evolution and development. We explored interactions between three regulators of early patterning, transcription factors Foxg1, Lhx2, and Pax6. Using combinations of double mutants, we identified mechanisms that regulate the formation and position of the cortical hem, a signaling center that is responsible for inducing hippocampal fate in adjacent cortical tissue. These genetic interactions provide insight into the early steps of patterning of the cortical primordium. Further, we found that hem is itself part of a forebrain hem system that may have arisen as part of an evolutionary mechanism to regulate cortical development.

References:

- Mangale et al., 2008: Lhx2 selector activity specifies cortical identity and suppresses hippocampal organizer fate. *Science* 319: 304-309, 2008
- Roy et al., 2013: Lhx2 regulates the development of the forebrain hem system. *Cerebral Cortex* 10.1093/cercor/bhs421

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