Neurogenin works in two ways

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The cerebral cortex originates from a single layer of proliferating neuroepithelial cells. The mechanisms by which neural stem cells give rise to neurons, astrocytes or oligodendrocytes can provide important clues for the treatment of neurodegenerative disease. But it is not known how the specification of one cell lineage results in the suppression of alternative fates.

In the 9 February issue of Cell, Yi Sun and colleagues show how the transcription factor neurogenin (Ngn1) is involved in cell-fate specification (*Cell* 2001, **104:**365-376). Working on cortical stem cells from rats, the researchers demonstrate that the bHLH transcription factor Ngn1, in addition to inducing neurogenesis, inhibits the differentiation of neural stem cells into astrocytes. Ngn1 promotes neurogenesis by functioning as a transcriptional activator. In inhibiting astrocyte differentiation, Ngn1 sequesters the CBP-Smad1 transcription complex away from astrocyte differentiation genes, preventing the activation of the STAT transcription factors necessary for gliogenesis.

Thus, two distinct mechanisms employed by the same transcription factor are involved in the activation and suppression of genes during neuronal cell-fate specification.

References

1. Sun Y, Nadal-Vicens M, Misono S, *et al:*Neurogenin promotes neurogenesis and inhibits glial differentiation by independent mechanisms. *Cell* 2001, 104:365-376., [http://qa.cell.com/content/vol104/issue3]

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