Lineage Progression of Cortical Neural Stem Cells and Cortical Excitatory Neuron Cell Fate Specification

April 18

Tuesday, 12:30 pm

Billings Building—Rosedale Room and Zoom

SPEAKER:

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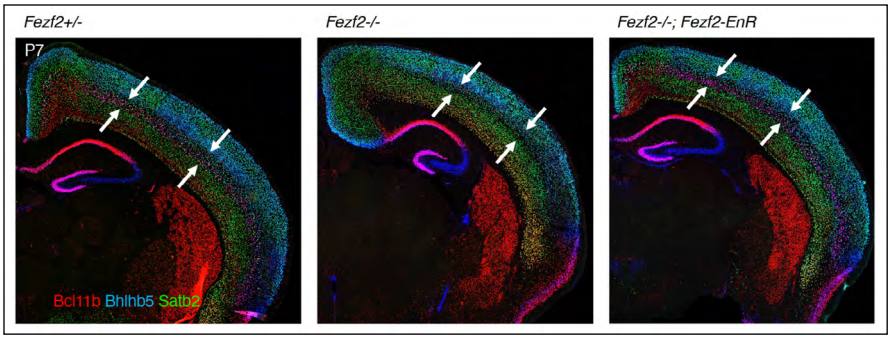
Abstract

The production of proper numbers of diverse neurons and macroglia by neural stem cells (NSCs) is essential for neural circuit formation and brain function. During development, neural stem cells (NSCs) in the cerebral cortex, known as the radial glial cells (RGCs), generate glutamatergic neurons that populate different cortical layers. As the generation of excitatory neurons ceases, cortical RGCs switch lineages and generate oligodendrocytes, astrocytes, and GABAergic olfactory bulb (OB) interneurons. Proper control of this lineage switch ensures the production of diverse neuronal and glial cell types in correct numbers. I will discuss our recent progress in understanding the molecular mechanisms underlying the lineage switch of cortical NSCs and cortical excitatory neuron fate specification.



Publications:

1. Eckler MJ, Nguyen TD, McKenna WL, Fastow BL, Guo C, Rubenstein JL, Chen B. Cux2-positive radial glial cells generate diverse subtypes of neocortical projection neurons and macroglia. (2015) Neuron 86(4): 1100-1108. PMID: 25996137.

2. Zhang Y, Liu G, Guo T, Liang XG, Du H, Yang L, Bhaduri A, Li X, Xu Z, Zhang Z, Li Z, He M, Tsyporin J, Kriegstein AR, Rubenstein JL, Yang Z, Chen B. Cortical Neural Stem Cell Lineage Progression Is Regulated by Extrinsic Signaling Molecule Sonic Hedgehog. Cell Rep. 2020 30(13):4490-4504. PMID: 32234482.

3. Tsyporin, J., Tastad, D., Ma, X., Nehme, A., Finn, T., Hubmer, L., Liu, G., Gallardo, D., Makhamreh, A., Roberts, J. M., Katzman, S., Sestan, N., McConnell, S., Yang, Z., Qiu, S., and Chen, B. Transcriptional repression by Fezf2 restricts alternative identities of cortical projection neurons. (2021) Cell Rep 35(12):109269. PMID: 34161768