9.14

Classes #35-38: Neocortex

Questions on development of neocortex, based on the following readings and on presentations:

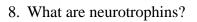
Purves and Lichtman, chapter 4 pp 91-95 (Movement and migration of neurons).

Rakic, P. A small step for the cell, a giant leap for mankind: a hypothesis of neocortical expansion during evolution. *Trends in Neurosciences* 18: 383-388, 1995.

- 1. What are cortical layers, cortical areas, and cortical columns?
- 2. What are the following regions: ventricular zone, marginal zone, cortical plate, subplate?
- 3. What are the following entities: progenitor cell, radial glia, migratory neuron?
- 4. What does "symmetric" and "asymmetric" cell division refer to?
- 5. How does tritiated thimidine help in establishing the birthdate of a cell? What is a problem associated with the technique? (The problem is alleviated by use of retrovirus-mediated gene transfer.)
- 6. What are the key issues in the debate over how cortex gets specified into different areas?

Questions on the role of activity in the shaping of cortical structure:

- 1. Why is the visual system a good model for examining the role of activity in cortical development?
- 2. How does sensory experience alter electrical activity in the brain?
- 3. What is the ocular dominance of a cell in primary visual cortex? What is an ocular dominance column?
- 4. What are the following terms: "critical period", "binocular competition"?
- 5. What is Hebb's postulate of learning? What does this have to do with activity-dependent development of cortical connections?
- 6. What is the NMDA receptor? What makes it special?
- 7. What is "long-term potentiation"?



9.	How might	neurotrophins	be involve	ed in com	petition reg	rulated by	neuronal	activit	v
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