

9.01 Study Questions

Sessions 15-18 Lecture Questions (Development)

1. Induction causes "determination" of a cell to follow one developmental path rather than another. Give an example of an inductive event in CNS development.
2. Contrast two types of neuronal migration.
3. Describe a growth cone.
4. What are the two major modes of axon growth? How are they different? What do you think might cause the mode of growth to change?
5. One student argues that growing axons lose many connections during development. Another insists that connections show large increases in development. How are both of them correct?
6. Define "apoptosis".
7. Contrast trophic and tropic effects of chemical factors which influence axon growth.
8. Describe an experiment on axonal development which shows that there is more to axonal growth than just following chemical signals to the correct target cells.
9. What are "guidepost cells" and where have they been found?
10. Where were netrins first found? How do they influence axon growth? Which axons?
11. Describe an inhibitory effect of glial cells on growth of axons. (Two examples given.) Do you know of any axon growth-promoting effects of glial cells?
12. Define collateral sprouting and its cause. How does it differ from true regeneration of axons?
13. Describe one phenomenon which demonstrates competition among axons during development.
14. Give two reasons why axonal growth in a thalamic region may increase after a brain injury.

Sessions 15-18 Reading Questions (Development)

Rosenzweig chapter 7

2.1, 2.3, 4.1, 4.2, 4.4, 4.5, 5.3, 6.2, 7.1, 7.2, 8.1, 8.3, 8.4, 9.1, 9.2, 9.4, 9.5, 10.1, 12.1, 13.2, 14.3, 15.1, 15.4, 16.1, 16.2, 17.1, 21.1, 21.3, 22.1.

Important terminology: apoptosis, behavioral teratology, cell adhesion molecules, cell migration, clones, congenital, differentiation, dunce and amnesiac and turnip, ectoderm, filopodia, genotype, growth cone, in vitro, induction, knockout, mitosis, mutation, myelination, nerve growth factor, neural groove, neural tube, neurogenesis, notochord, prosencephalon, radial glial cells, regulation, retrograde degeneration, synaptogenesis, transgenic, transneuronal degeneration (or atrophy), ventricular layer, Wallerian degeneration (=anterograde degeneration), zygote. (Just read and understand the short definitions given in the Study Guide.)