

Study Questions Lecture 15

Rosenzweig Chapter 7

1. What is one structure formed by migrating neural crest cells?
2. At approximately what age does the human brain stop growing?
3. Describe each of the six stages of nervous system development.
 - a. neurogenesis
 - b. cell migration
 - c. differentiation
 - d. synaptogenesis
 - e. cell death
 - f. synapse rearrangement

What is happening to the brain at each of these stages? is it enlarging? refining?

4. What is the main function of radial glia? In which of the six stages (listed above) are they critically involved?
5. Describe the two influences that control neuronal differentiation.
 - a. Which structure induces the differentiation of neural tube cells into motor neurons?
 - b. Why might it be useful to place stem cells in areas of the brain where neuronal degeneration has occurred?
6. What is a growth cone? What guides the growth cone to its proper target?
7. Why might so many neurons undergo cell death during early development?
8. NGF and BDNF are _____ .
 - a. How do they influence the survival of neurons?
9. Describe Sperry's chemoaffinity hypothesis.
 - a. In what sensory system is this hypothesis usually tested?
10. How does multiple sclerosis cause severe impairment of sensory and motor function?
11. Name one intrinsic and two extrinsic factors that affect neural development.

12. Do clones (two individuals with identical genes) have identical phenotypes (physical structure: neural connections, color, shape, size)? Why or why not?
 - a. Do you know any clones? Are they exactly the same?
13. Why are mutant animals useful in the study of the nervous system?
14. Describe one experiment that demonstrated the existence of a “sensitive period” during development of the visual system.
15. What are the properties of a Hebbian synapse?
16. Describe one experiment that demonstrated that sensory input is able to organize brain circuits.
17. Describe two genetic disorders that affect the proper functioning of the nervous system.
18. What are some of the cognitive and neuropathological (cellular) symptoms of Alzheimer’s disease?