

STUDY GUIDE FOR 107A MIDTERM 1 EXAM

1. What is the neuron doctrine? Who suggested it first?
2. What determines the variety of cells in the brain?
3. What is the Law of Dynamic Polarization?
4. What is the role of the mitochondria? Endoplasmic reticulum? Spines on dendrites? Layers in cortex?
5. What are the different types of glial cells? What do they do?
6. What is the role of the choroids plexus? What are the functions of CSF?
7. What connects the two hemispheres?
8. What can you say about the topography of the corpus callosum?
9. What anatomical features of the nervous systems are shared by all vertebrate species?
10. What is encephalization? Why do humans have such a large encephalization index?
11. How do strategies for finding food and differences in lifestyle relate to brain evolution?
12. Do you know the difference between homologous and analogous brain areas?
13. What are some lessons of evolution?
14. What are some features of mammalian evolution?
15. What is the organization (in terms of inputs/outputs) of the 6 layers of cortex?
16. What's a growth cone and why is it important?
17. What is ReIn and what is it for? What are 3 molecular mechanisms involved in migration?
18. What are the phases of cell division during the proliferation stage of brain development?
19. What is the purpose of cell death and synaptic rearrangement during brain development? What factors contribute to it?
20. What is the role of radial glia?
21. What is exuberancy? How does it relate to Hebbian learning rules? Why do axonal connections retract during the last stages of brain development?
22. Can you give an example of the role of experience in wiring the brain?
23. What's the role of myelin in signal conduction?
24. What are sulci and gyri?
25. Explain why hydrocephaly occurs
26. What are the five main subdivisions of the CNS during development? What important brain regions arise from these subdivisions?
27. What happens during the cell proliferation stage of brain development?
28. What happens during the differentiation stage of cell development?
29. When does migration begin?
30. What is a self-organizing system?
31. How would you describe the role of genetics and environment in brain development?
32. What are the stages of brain development?
33. What distinguishes passive and active cell migration?
34. What are the 3 meningeal layers? What's the general role of the meninges?
35. Could you identify the superior and inferior colliculi in a sagittal section? What about the cingulate cortex? Pons? Hypothalamus? Can you identify some of the more important areas of the brain in a horizontal, lateral or coronal view?
36. What do cell adhesion molecules (CAMs) do?
37. What are the anatomical landmarks that separate the different lobes of the brain?
38. What takes place during neural induction? What's the role of the Organizer?

39. Describe axonal guidance mechanisms during synaptogenesis
40. What are two Hebbian learning rules?
41. What are lamellipodium and filopodia? What role do they play?
42. How does an axon grow to its target?
43. Describe how apoptosis works.