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9.01 Introduction to Neuroscience  
Fall 2007

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## 9.01 Recitation (R02)

### Recitation #1: Tuesday, September 11<sup>th</sup>

Review of Lectures: 1, 2

Reading: Chapters 1,2 of *Neuroscience: Exploring the Brain* (3<sup>rd</sup> edition)

#### Outline of Recitation:

##### I. Introduction:

###### 1. Structure of Recitation:

- review of lecture, psets, exams
- questions?

###### 2. Quick Tips on Course:

- go to recitation (5% of final grade)
- do the psets
- read the textbook
- neuroanatomy quiz: p.206-248 in textbook
- resources:
  - Brown Neuro Course website: <http://www.brown.edu/Courses/BN01/>
  - OCW

##### II. Review of Material:

###### 1. Brain Basics (covered by Professor Seung)

###### 2. Neurons and Glia (covered by Professor Bear)

- neurons vs. glia
- nissl stain vs. golgi stain
- Reticular theory vs. Neuron Doctrine
- parts of the neuron
- axoplasmic transport
- classification of neurons

##### III. Practice Exam Questions

#### Brain Basics:

Parts of the nervous system:

Lobes of the brain:

**Neurons and Glia:**

- Two types of cells in the brain:

\_\_\_\_\_ Neurons \_\_\_\_\_

vs.

\_\_\_\_\_ Glia \_\_\_\_\_

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-

-  
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- Histology:

\_\_\_\_\_ Nissl Stain \_\_\_\_\_

vs.

\_\_\_\_\_ Golgi Stain \_\_\_\_\_

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- Theories:

\_\_\_\_\_ Reticular Theory \_\_\_\_\_

vs.

\_\_\_\_\_ Neuron Doctrine \_\_\_\_\_

-  
-

-  
- Neurons communicate by \_\_\_\_\_, not \_\_\_\_\_.

- Parts of the neuron:

Neuron:

Synapse:

Cytoskeleton:

- Microtubules:
- Neurofilaments:
- Microfilaments:

- Axoplasmic Transport:

- Classification of Neurons:
  - # of neurites:
  - types of dendrites:
  - length of axon:
  - shape of dendritic tree:
  - connection with periphery:

### **Practice Exam Questions:**

1. Neurons:

- a) Make up 10% of the cells in the brain
- b) Always have 2 neurites
- c) Wrap around glial cells providing insulation
- d) Are present only in the brain

2. All of the following statements about dendrites are generally true EXCEPT:

- a) they range from millimeters to meters in length
- b) there are many extending from a single soma
- c) they taper from one end to the other
- d) they are often spiny

3. While traveling around the human body, you run into Sheriff Nosore, Herpes Fighter. He is chasing the herpes virus from the soma to the axon terminal bouton. Which direction and mechanism does he use.

- a) Anterograde and Dynein
- b) Anterograde and Kinesin
- c) Retrograde and Dynein
- d) Retrograde and Kinesin

4. The cellular organelle most appropriately called a “protein building machine” is the:

- a) Golgi apparatus
- b) mitochondrion
- c) microtubule
- d) ribosome
- e) smooth endoplasmic reticulum

5. The cellular organelle that produces ATP for energy-demanding activities in the neuron is the:

- a) Golgi apparatus
- b) mitochondrion
- c) microtubule

- d) ribosome
- e) smooth endoplasmic reticulum

6. You inject a RETROGRADE tracer into the cerebral cortex of a little horse named Peter. AXOPLASMIC TRANSPORT will carry the tracer to the \_\_\_\_\_ of neurons that have \_\_\_\_\_ near the site of injection.

- a) axon terminals / cell bodies
- b) axon terminals / dendrites
- c) cell bodies / axon terminals
- d) cell bodies / dendrites

7. Which of the following is correct about glia?

- a) glia reside only in the frontal lobe
- b) glia make up 90% of the cells in the brain
- c) glia fire action potentials
- d) the brain can function normally without glia

8. A guy got fired from your lab for not keeping his notebook up to date. Your job is to analyze the slides he prepared. Under the microscope you see scattered, beautiful, fully labeled neurons. You conclude that he used:

- a) a nissl stain
- b) a golgi stain
- c) a cajal stain
- d) a professor Stein

9. The Neuron Doctrine was championed by \_\_\_\_\_, and the Reticular Theory was supported by \_\_\_\_\_.

- a) Nissl, Cajal
- b) Golgi, Nissl
- c) Cajal, Golgi
- d) Penrose, Darwin

10. Which of the following would you expect to see in the brain of a patient with Alzheimer's Dementia?

- a) Neurofibrillary Tangles
- b) Tau Proteins dissociated from microtubules
- c) Axon degeneration
- d) All of the above
- e) none of the above

11. Dendrites differ from axons because:

- a) Dendrites are uniform in diameter whereas axons taper
- b) Axons can have spines or be smooth, whereas dendrites always have spines.
- c) On average, dendrites are shorter in length whereas axons are longer
- d) Axons can be postsynaptic surfaces whereas dendrites cannot

Answers:

- 1) A 2) A 3) B 4) D 5) B 6) C 7) B 8) B 9) C 10) D 11) C