

## Recitation 9 Worksheet

For the following questions, choose all that apply:

1. Which of the following statements about the mammalian visual system are correct:
  - a. All inputs from one eye go to the contralateral side of the brain
  - b. All inputs from one side of the visual field (whether seen by the right eye or left eye) go to the contralateral side of the brain
  - c. An ophthalmoscope can be used to visualize axons of the optic nerve and see pathologies such as multiple sclerosis
  - d. The visual cortex is organized in horizontal layers, with each alternate layer receiving inputs from one eye or the other
  
2. Which statements about rods and cones are correct:
  - a. Rods and cones are permanent, no part of them ever regenerates
  - b. Cones contain three kinds of 11-cis-retinal, so they can detect colors
  - c. Cones are concentrated in the fovea and are less numerous than rods
  - d. Rods contain melanin pigment in intramembranous disks
  - e. When light enters the eye, it hits rods and cones first
  
3. Think of the signal transduction pathway in rods and cones and choose all that apply:
  - a. In the dark, the voltage gated Ca channels are closed
  - b. When moving from light to dark, guanylyl cyclase becomes activated
  - c. If cGMP is abundant in the cell, the cell is depolarized
  - d. In the light, cGMP-gated Na channels close
  - e. Each rhodopsin molecules can activate on the order of 100 G proteins (transducins)
  
4. Which of the following are true about developmental plasticity:
  - a. During early development, several neurons innervate the same area of the muscle, each neuron only tries to connect to one muscle
  - b. During the process of long term depression, asynchronous activity leads to AMPA R internalization and synapse elimination
  - c. The punishment signal, mediated by PKA, causes endocytosis of AchRs
  - d. Rodents reared in an enriched environment show the development of more dendritic spines

Answers

1. B, C    2. C    3. C, D, E    4. B, D

### **Test your blind spot!**

Start with the paper arms-length away. Close your left eye and stare at the plus sign with your right eye. Move the paper slowly closer to your eye until the dot on the right disappears! At this point, the image of the dot is falling on your right eye's optic disk, the location on your retina from which all the ganglion cell axons exit. Since the area lacks any photoreceptors, you are blind to any object whose image falls there!



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