

**Readings Study Questions for Lecture 19**

**On Bizzi et al. “Modular organization of motor behavior in the frog's spinal cord”:**

1. What is a “CFF”? What does it tell us about the neural control of movement?
2. Why does a vector summation code make sense in terms of organizing a motor output signal that must specify an endpoint in 3-dimensional space?

**On Rosenzweig Chapter 11a pages 323-338 “Movements and Actions”:**

3. What is the difference between a “closed-loop” and an “open-loop” control mechanism? Give an example of each.
4. What is the (general) function of the brainstem, primary motor cortex, cerebellum, and basal ganglia in the context of a motor control system?
5. What makes up a “motor unit”? How does it develop?
6. a. What feature of muscle do the primary and secondary sensory endings in the muscle spindle detect? What is the difference between the information they encode?  
b. What feature of the spindle do gamma motoneurons in the muscle spindle control? Why do we need a motor output to the muscle spindle, a sensory organ?  
c. What feature of muscle do alpha motoneurons control? How does this happen at the cellular level?  
d. What feature of muscle do receptors in the golgi tendon organ detect?  
e. Is there a motor output to the golgi tendon organ? Why or why not?