

9.14 2005

Sessions #15 - 17: Motor systems

March 7, 9, 11

Questions based on lectures:

1. What are three major types of movement from a functional point of view?
2. What two sensory modalities most strongly shaped the evolution of the forebrain?
3. What is the basic spatial layout of motor neurons at one of the spinal cord enlargements?
4. Describe the three types of lesions in the Lawrence and Kuypers lesion study of the descending motor system pathways.
5. What are three basic types of explanations of temporal patterns of movements?
6. What was the basic argument in Karl Lashley's paper in 1917 called "The problem of serial order in behavior"?

Supplementary questions from lectures:

7. For the mammalian midbrain, what are three outputs that influence specific types of movement? Name the structures where these outputs originate.
8. Locomotion is often initiated because of activity generated in what diencephalic structure?
9. Maintaining balance of the body during standing or locomotion depends on reticulospinal pathways from the hindbrain, and on two other descending pathways. What are they?
10. The midbrain tectum controls two major types of movements basic to survival. What are they? How do the output pathways for these two movements differ?
11. Grasping with the hands in large primates is largely controlled by neocortex. What brainstem structure appeared earlier in evolution and controlled this kind of movement?
12. Describe functions of the three major pathways or groups of pathways that were separately destroyed by surgical lesions in the Lawrence and Kuypers study of motor control in the monkey.
13. What is Deacon's rule? What does it predict about the projections (outputs) of the optic tectum in birds, with a very large tectum, and nocturnal mammals, with a much smaller tectum?
14. Name a movement pattern in an animal or human that is largely under the control of hindbrain and spinal cord structures and is centrally generated, once it is triggered.
15. Name two brainstem cell groups or types that have very widespread projections to other parts of the central nervous system. What kind of functions are these projections involved in?