Brain, Cranial Nerves, and Spinal Cord

• Objectives for today’s lab
  – Become familiar with the gross anatomy of the brain and spinal cord
  – Become familiar with the histology of nerve tissue and the spinal cord
  – Become familiar with the gross anatomy of the ear and the eye (Remember: you are responsible ONLY for the structures listed in your Laboratory Guide – please see Addendum and revised Study Guide)

Nervous Tissue (slide # 1525)

• Major characteristics
  – Mononucleated (usually central)
  – Many cytoplasmic extensions
  – Usually surrounded by small, glial cells (supporting cells)

• Major Functions
  – Transmission of nerve impulses
  – Sensory reception
Nervous Tissue

Overview of the Nervous System

Parts of the Brain

Average male brain = 1,600g, average female brain = 1,450g

Figure from Saladin, Anatomy & Physiology, McGraw Hill, 2007

Figure from: Saladin, Anatomy & Physiology, McGraw Hill, 2007

DIAGRAM TO KNOW FOR EXAM
Brain – Posterior View

- Transverse fissure

Brain

- Frontal lobe
- Parietal lobe
- Temporal lobe
- Occipital lobe
- Ventricular system

Ventricles of the Brain

Ventricles make and circulate cerebrospinal fluid, CSF
Histology of Cerebral Cortex

Gray Matter (Cortex)

Gyrus

Sulcus

White Matter

The Brain

Cranial Nerves (CN or N)

Optic chiasma

Trigeminal nerve (V)

Oculomotor nerve (III)

Vestibulo-cochlear nerve (VIII)

Vagus nerve (X)

Choroid plexus

Accessory nerve (XI)

Olfactory bulb

Olfactory tract

Optic nerve (II)

Infundibulum

Optic tract

Meninx (Pia)

Central sulcus

Sylvian fissure

Mushroom-shaped Inferior View

DIAGRAM TO KNOW FOR EXAM
Spinal Cord

Posterior horn (axons of sensory neurons)

Lateral horn

Gray matter

Central canal

Anterior horn (cell bodies of motor neurons)

Anterior median fissure

White matter

The Ear

The Middle Ear

[Diagrams of the Spinal Cord, The Ear, and The Middle Ear are present.]

[The text contains names of anatomical structures related to the spinal cord, ear, and middle ear.]
The Extrinsic Muscles of the Eye

Be able to identify all the extrinsic eye muscles shown;
Note the position and insertion of the tendon of the superior oblique

Internal Structure of the Eye

Transverse section through right eye

Structure of the Eye
1. Muscle Histology
   - Identify the type of muscle shown in a photomicrograph.
   - List the characteristics for each type of muscle that enabled you to make the identification in above.
   - State where each type of muscle is found in the body (see Figure 6.7, a-c, in Marieb’s Lab Manual for complete rats and photomicrographs).
   - Identify unique structures in the photomicrographs, e.g., striations, intercalated disks, nuclei, etc.

2. Skeletal Muscle Gross Anatomy
   - Be able to identify and name the human and/or cat skeletal muscles listed in your Laboratory Study Guide when given:
     - a) A photograph/illustration of human muscles in Figures 15.2 and 15.3 in Marieb’s Laboratory Manual
     - b) A dissected cat or photograph of a dissected cat

3. Human Brain Models and Sheep Brains
   - Be able to identify and name the structures listed in your Lab Study Guide using the human brain models or photographs of the human brains (from designated slides in Lab 13).
   - Be able to identify and state the number and name of four of the twelve cranial nerves: I, II, III, and V on the human brain models/photographs. (See designated slide in Lab 13.)

4. Spinal Cord Models
   - Label parts of a spinal cord given either a silver stained micrograph, an illustration of the spinal cord, or a spinal cord model (use the two slides given here and learn these).
   - Be able to name the horns (ventral, dorsal, lateral) of the spinal cord and the types of cells found in each horn (motor vs. sensory), given either a model of the spinal cord or a microscope slide. (Use the same two slides designated in lab)

5. Eye/Ear
   - Label diagrams of the Eye and Ear from the slides designated for Lab 13 (be sure to know both the common and Latin names for middle ear bones)
Sheep Brain

1. olfactory bulb
2. olfactory tract
6. optic chiasma
7. optic nerve
8. optic tract
10. opening where the infundibulum attaches
11. mamillary body
13. trigeminal nerve
14. pons
15. trochlear nerve
16. abducens nerve
17. facial nerve
18. spinal cord
20. medulla oblongata
21. ocular motor nerve
3. Hypothalamus |  7. Superior colliculus | 11. Arbor vitae (white matter) |

Sheep Brain – Sagittal Section

1. lateral ventricle | 8. arbor vitae | 13. mammillary body
2. fornix | 9. cerebellar cortex (grey matter) | 15. mammillary body
3. corpus callosum | 10. medulla oblongata | 16. hypothalamus
4. pineal body | 11. fourth ventricle | 18. optic chiasma
5. superior colliculus | 12. central aqueduct | 19. olfactory bulb
6. inferior colliculus | 13. pons |
7. transverse fissure | 14. pituitary gland |