ANATOMY OF THE SPINAL CORD - CROSS SECTION

PRE-LAB: Read the introduction to the lab and answer the following questions.

1. Where does the spinal cord start and stop in the vertebral column?

2. What types of impulses are in ascending pathways of the spinal cord?

3. What types of impulses are in descending pathways of the spinal cord?

4. Label or color code the two pathways in the following diagram. Use p. 475 in your textbook for help:

5. What are “tracts” and where are they found?

6. How are funiculi named?

7. What 3 parts of a neuron do you find in the gray matter?
INTRODUCTION:
The spinal cord is a slightly flattened cylinder with a canal through the middle. It emerges from the base of the brain at the level of the foramen magnum and extends caudally to the level of the first or second lumbar vertebra. It is about 45 cm in length and about the diameter of your little finger. It has many nerve tracts (groups of axons traveling together) moving up (ascending) and down (descending) its length. Ascending pathways carry sensory impulses and descending pathways conduct motor impulses. This extension of the brain is certainly one of the most remarkable anatomical features of the human organism.

While viewing the spinal cord, remember anterior is the same as ventral and posterior is the same as dorsal. The white matter found around the outside of the spinal cord is made up of myelinated axons in bundles called tracts. There are 3 areas of white matter, grouped based on the type of nerve tract found there. They are called funiculi-posterior, anterior and lateral. They contain nerve tracts with similar destinations and functions. Inside the spinal cord you find gray matter which is made up of unmyelinated axons, dendrites of association neurons and cell bodies. The shape of the gray matter contains projections called horns.
DIRECTIONS:

1. Obtain a slide of a cross section of the spinal cord. Study the slide without the microscope to start. Record your observations below concerning the shape and size of the cord.

Observations:
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2. Observe the slide under the microscope under LOW power. Find each of the following structures in the slide and label them on the diagram below.

*NOTE: Be sure to find each of the structures on the slide. You will be tested over these structures—“lab practical style” on your unit test.

1. anterior (ventral) median fissure
2. posterior median sulcus
3. Gray matter area
4. anterior (ventral) horn
5. posterior (dorsal) horn
6. central canal
7. White matter area
8. anterior funiculus
9. posterior funiculus
10. lateral funiculus
3. Notice the white matter in the outer areas of the spinal cord. It is made of myelinated and some unmyelinated neurons that allow communication between different parts of the spinal cord and between the cord and the brain.

Focus on a small area of white matter using high magnification. View and draw a small area of the white matter. Include SEVERAL cross-sections of mostly axons of the neurons. Label the **axon** and **myelin sheath** on one of the cross sections.

![Diagram of white matter](image)

4. Focus on the gray matter inside the spinal cord. It is made of neuron cell bodies, their unmyelinated processes and other support cells. Focus on a small area using high magnification and draw a small area of the gray matter. Include several cross sections of these cell bodies and processes. Label a **cell body** and an **unmyelinated fiber**.

![Diagram of gray matter](image)

Why do the gray and white areas look slightly different from each other microscopically?

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