

## ACTIVITY



# NERVOUS SYSTEM HISTOLOGY, BRAIN, CRANIAL NERVES

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## OBJECTIVES

1. **How to get ready:** Read CHAPTERS 14 & 15 MCKINLEY ET AL., *HUMAN ANATOMY*, 5E. All text references are for this textbook. **Read dissection instructions BEFORE you come to class.**
2. Histology: Identify structures indicated on three different slides or images of nervous system tissue. Some of these structures are also visible on the classroom model of a neuron.
3. Human brain: Identify listed structures of the human brain on classroom models, the cranial meninges, and structures involved in cerebrospinal fluid circulation.
4. Human brain: Identify the 12 pairs of cranial nerves **by name and number** on a model and on the sheep brain.
5. Dissect a sheep brain and identify structures listed. **YOU MUST BRING YOUR OWN GLOVES FOR THIS ACTIVITY.**
6. **Before next class:** Preview Peripheral Nervous System, Eye, and Ear terms lists from SLCC Anatomy Laboratory website or your printed laboratory manual and your textbook.

# Activity 7

## NERVOUS SYSTEM TISSUES: HISTOLOGY SLIDES

TABLE 7-1. Spinal cord smear and neuron model	
STRUCTURE	TEXT REFERENCES AND SKETCH
<input type="checkbox"/> multipolar neuron	DESCRIBED: PP. 414–418, 421 FIG. 14.3
<input type="checkbox"/> cell body (soma)	
<input type="checkbox"/> nucleus	
<input type="checkbox"/> chromatophilic substance (or Nissl bodies)	
<input type="checkbox"/> dendrites	
<input type="checkbox"/> axon hillock	
<input type="checkbox"/> axon	
<input type="checkbox"/> axon telodendria	
<input type="checkbox"/> axon terminals/synaptic knobs/synaptic bulbs	
<input type="checkbox"/> glial cell	

TABLE 7-2. Cross section of a nerve	
STRUCTURE	TEXT REFERENCES AND SKETCH
<input type="checkbox"/> nerve	DESCRIBED: PP. 424–425 FIG. 14.12A & B
<input type="checkbox"/> axon (with myelin sheath)	
<input type="checkbox"/> endoneurium	
<input type="checkbox"/> fascicle	
<input type="checkbox"/> perineurium	
<input type="checkbox"/> epineurium	

TABLE 7-3. Teased myelinated nerve fibers	
STRUCTURE	TEXT REFERENCES AND SKETCH
<input type="checkbox"/> axon	DESCRIBED: PP. 414; 421-422 FIG. 14.12C
<input type="checkbox"/> myelin sheath	
<input type="checkbox"/> neurofibril nodes	
<input type="checkbox"/> neurolemmocyte ( <i>or</i> Schwann cell) nucleus	

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## Brain Anatomy

The adult brain is composed of the **cerebrum**, the **diencephalon**, the **brainstem**, and the **cerebellum**. There are spaces within the brain called ventricles. The cranial nerves are (PNS) nerves directly attached to the brain.

**TABLE 7-4. Cerebrum:** Basic organization of the cerebrum is—superficial gray matter, deep (central) white matter, and deeper gray matter (cerebral nuclei).

STRUCTURE	SIGNIFICANCE	TEXT REFERENCES AND NOTES
<input type="checkbox"/> gyrus (pl., <i>gyri</i> )	“hills” (gyri) and “valleys” (sulci) create surface area necessary for the massive amount of cerebral cortex tissue within the cranial cavity	<b>DESCRIBED: P. 437 FIG. 15.1</b>
<input type="checkbox"/> sulcus (pl., <i>sulci</i> )		
<input type="checkbox"/> gray matter <input type="checkbox"/> cerebral cortex	location of neuron cell bodies, dendrites, and unmyelinated axons	<b>DESCRIBED: P. 440 FIG. 15.3</b>
<input type="checkbox"/> white matter	connects regions within the nervous system; derives its color from the myelin in the myelinated axons; bundles of white matter in the CNS are called <b>tracts</b>	
<input type="checkbox"/> cerebral hemispheres (right and left)	each hemisphere receives and sends information to the opposite side of the body (with a few exceptions)	<b>DESCRIBED: P. 450 FIG. 15.10</b>
<input type="checkbox"/> longitudinal fissure	separates cerebral hemispheres	
<input type="checkbox"/> corpus callosum	provides the primary white matter communication link between the cerebral hemispheres	<b>DESCRIBED: PP. 450–451, 457 FIG. 15.1C, 15.3</b>

**TABLE 7-4. Cerebrum:** Basic organization of the cerebrum is—superficial gray matter, deep (central) white matter, and deeper gray matter (cerebral nuclei).

STRUCTURE	SIGNIFICANCE	TEXT REFERENCES AND NOTES
<input type="checkbox"/> frontal lobe	anterior portion of the cerebral cortex; primarily concerned with voluntary motor functions, concentration, verbal communication, decision making, planning and personality	<b>DESCRIBED: PP. 451–452 FIG. 15.10, 15.11</b>
<input type="checkbox"/> precentral gyrus	portion of the frontal lobe that houses the <b>primary motor cortex</b> , where neurons control voluntary skeletal muscle activity	
<input type="checkbox"/> central sulcus	boundary between frontal and parietal lobes	
<input type="checkbox"/> parietal lobe	portion of the cerebral cortex involved with general sensory functions	
<input type="checkbox"/> postcentral gyrus	portion of the parietal lobe that houses the <b>primary somatosensory cortex</b> , where neurons receive somatic sensory information from touch, pressure, pain, and temperature receptors	
<input type="checkbox"/> parieto-occipital sulcus	boundary between parietal lobes and occipital lobe	
<input type="checkbox"/> occipital lobe	posterior portion of the cerebral cortex responsible for processing incoming visual information and storing visual memories	
<input type="checkbox"/> lateral sulcus	boundary between frontal/parietal lobes and temporal lobe	
<input type="checkbox"/> insula	portion of the cerebral cortex deep to the lateral sulcus	
<input type="checkbox"/> temporal lobe	lateral portion of the cerebral cortex involved with hearing and smell	

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**TABLE 7-4. Cerebrum:** Basic organization of the cerebrum is—superficial gray matter, deep (central) white matter, and deeper gray matter (cerebral nuclei).

STRUCTURE	SIGNIFICANCE	TEXT REFERENCES AND NOTES
<input type="checkbox"/> fornix	thin tract of white matter involved in limbic system functions	<b>DESCRIBED: P. 468</b> <b>FIG. 15.15, 15.23</b>
<input type="checkbox"/> septum pellucidum	thin partition that separates lateral ventricles	<b>DESCRIBED: P. 446</b> <b>FIG. 15.15</b>
<input type="checkbox"/> cerebral nuclei ( <i>or</i> basal nuclei)	deep bodies of gray matter within the cerebrum, often paired	<b>DESCRIBED: PP. 457–458</b> <b>FIG. 15.14</b>
<input type="checkbox"/> lateral ventricles	spaces within the cerebral hemispheres that produce and circulate cerebrospinal fluid (CSF)	<b>DESCRIBED: P. 446</b> <b>FIG. 15.6, 15.14</b>

**TABLE 7-5. Diencephalon:** Composed of **epithalamus**, **thalamus**, and **hypothalamus** and other associated structures.

STRUCTURE/REGION	SIGNIFICANCE	TEXT REFERENCES AND NOTES
<input type="checkbox"/> <b>EPITHALAMUS</b>	an endocrine gland; secretes the hormone melatonin, which helps regulate the body's circadian rhythm	<b>DESCRIBED: P. 459</b> <b>FIG. 15.15</b>
<input type="checkbox"/> pineal gland		
<input type="checkbox"/> <b>THALAMUS</b>	relays sensory impulses from all conscious senses (except olfaction) to cerebral cortex	<b>DESCRIBED: P. 459</b> <b>FIG. 15.15, 15.16</b>
<input type="checkbox"/> interthalamic adhesion ( <i>or</i> intermediate mass)	gray matter that connects the right and left halves of the thalamus	

## Nervous System Histology, Brain, Cranial Nerves

**TABLE 7-5. Diencephalon:** Composed of **epithalamus, thalamus, and hypothalamus** and other associated structures.

STRUCTURE/REGION	SIGNIFICANCE	TEXT REFERENCES AND NOTES
<input type="checkbox"/> <b>HYPOTHALAMUS</b>	<ul style="list-style-type: none"> <li>• control of autonomic nervous system and endocrine system</li> <li>• regulation of body temperature and circadian rhythms</li> <li>• control of emotional behavior, food and water intake</li> </ul>	<b>DESCRIBED: PP. 460, 607</b> <b>FIG. 15.1B, 15.17, 15.18, TABLE 15.6</b>
<input type="checkbox"/> mammillary body	processes sensations related to smell	
<input type="checkbox"/> infundibulum	attaches hypothalamus to pituitary gland	
<input type="checkbox"/> pituitary gland	hormone secretion; attached to hypothalamus via the infundibulum	<b>DESCRIBED: PP. 607–608</b> <b>FIG. 15.15, 15.17, 20.4</b>
<input type="checkbox"/> optic chiasm (chiasma)	optic nerves cross here before becoming optic tracts	<b>FIG. 15.1B, 15.24, 15.18</b>
<input type="checkbox"/> optic tracts	CNS tracts carrying sensory impulses from eyes and optic nerves, through the optic chiasm to the brain	<b>DESCRIBED: P. 578</b> <b>FIG. 15.1B, 15.24</b>
<input type="checkbox"/> third ventricle	space between the halves of the thalamus that produces and circulates CSF	<b>DESCRIBED: P. 446</b> <b>FIG. 15.6, 15.13, 15.14</b>

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**TABLE 7-6. Brainstem:** Composed of the **mesencephalon, pons, medulla oblongata**, and other associated structures.

STRUCTURE		SIGNIFICANCE	TEXT REFERENCES AND NOTES
<input type="checkbox"/> <b>MIDBRAIN (OR MESENCEPHALON)</b>			DESCRIBED: PP. 437, 461 FIG. 15.1C, 15.18, 15.19
<input type="checkbox"/> corpora quadrigemina			
<input type="checkbox"/> superior colliculus (pl. <i>colliculi</i> )	visual reflex center		DESCRIBED: P. 461 FIG. 15.15, 15.18, 15.19
<input type="checkbox"/> inferior colliculus (pl. <i>colliculi</i> )	auditory reflex center		
<input type="checkbox"/> cerebral peduncles	largely composed of white matter tracts connecting pons and cerebrum		
<input type="checkbox"/> <b>PONS</b>	<ul style="list-style-type: none"> <li>contains white matter tracts for communication between brain and spinal cord</li> <li>contains gray matter for control of respiration</li> </ul>		DESCRIBED: PP. 461, 464 FIG. 15.1, 15.18, 15.20
<input type="checkbox"/> <b>MEDULLA OBLONGATA</b>	<ul style="list-style-type: none"> <li>contains white matter for communication between brain and spinal cord</li> <li>contains gray matter that regulates vital functions like cardiovascular function and respiration</li> </ul>		DESCRIBED: P. 464 FIG. 15.1, 15.18
<input type="checkbox"/> cerebral aqueduct	CSF passageway between third and fourth ventricles		DESCRIBED: P. 446 FIG. 15.6, 15.15, 15.22
<input type="checkbox"/> fourth ventricle	space between brainstem and cerebellum that produces and circulates CSF		



## Nervous System Histology, Brain, Cranial Nerves

**TABLE 7-7. Cerebellum:** Involved in coordinated movements, balance, and muscle/joint proprioception; helps maintain balance.

STRUCTURE	SIGNIFICANCE	TEXT REFERENCES AND NOTES
<input type="checkbox"/> vermis	narrow band of cerebellar cortex that separates cerebellar hemispheres	<b>DESCRIBED: PP. 465-466 FIG. 15.22</b>
<input type="checkbox"/> cerebellar hemispheres	two halves of the cerebellum	
<input type="checkbox"/> arbor vitae	white matter pattern within cerebellum	

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## CSF Circulation Structures and Cranial Meninges

TABLE 7-8. Dural venous sinuses, cranial meninges and spaces, and cranial dural septa		
STRUCTURE	SIGNIFICANCE	TEXT REFERENCES AND NOTES
<input type="checkbox"/> <b>MENINGES AND SPACES</b>		<b>DESCRIBED: P. 444 FIG. 15.4, 15.5</b>
<input type="checkbox"/> dura mater	two-layered dense irregular connective tissue membrane protecting the brain and spinal cord	
<input type="checkbox"/> subdural space	potential space between the dura mater and the arachnoid; subdural hematomas occur here	
<input type="checkbox"/> arachnoid (mater)	delicate web of collagen and elastic fibers between the dura mater and the pia mater	
<input type="checkbox"/> subarachnoid space	<ul style="list-style-type: none"> <li>• space within the arachnoid</li> <li>• CSF circulates here</li> <li>• contains arachnoid villi and connecting fibers between arachnoid mater and pia mater</li> </ul>	
<input type="checkbox"/> pia mater	thin layer of delicate areolar connective tissue in contact with brain and spinal cord; highly vascularized	
<input type="checkbox"/> <b>CRANIAL DURAL SEPTA</b> —Flat partitions of dura mater extending into the cranial cavity		<b>DESCRIBED: P. 445 FIG. 15.5</b>
<input type="checkbox"/> falx cerebri	portion of dura mater that projects between cerebral hemispheres	
<input type="checkbox"/> tentorium cerebelli	portion of dura mater that separates occipital and temporal lobes from cerebellum	
<input type="checkbox"/> falx cerebelli	portion of dura mater that divides cerebellar hemispheres	

**TABLE 7-8. Dural venous sinuses, cranial meninges and spaces, and cranial dural septa**

STRUCTURE	SIGNIFICANCE	TEXT REFERENCES AND NOTES
<input type="checkbox"/> <b>DURAL VENOUS SINUSES</b> —Large veins that drain blood from the brain into the internal jugular veins		DESCRIBED: PP. 445, 447–449, 691 FIG. 15.4, 15.5, 15.8, 23.11B
<input type="checkbox"/> superior sagittal sinus <input type="checkbox"/> inferior sagittal sinus <input type="checkbox"/> straight sinus <input type="checkbox"/> transverse sinus (R & L) <input type="checkbox"/> confluence of sinuses <input type="checkbox"/> sigmoid sinus (R & L)		

**TABLE 7-9. Ventricles:** Ventricles are hollows within the brain in which cerebrospinal fluid is produced and circulated. The ventricles are continuous with the central canal of the spinal cord.

STRUCTURE	SIGNIFICANCE	TEXT REFERENCES
<input type="checkbox"/> lateral ventricles		DESCRIBED: P. 446 FIG. 15.6, 15.14
<input type="checkbox"/> third ventricle		DESCRIBED: P. 446 FIG. 15.6, 15.13, 15.14
<input type="checkbox"/> cerebral (mesencephalic) aqueduct		DESCRIBED: P. 446 FIG. 15.6, 15.15, 15.22
<input type="checkbox"/> fourth ventricle		
<input type="checkbox"/> central canal (of spinal cord)		DESCRIBED: P. 446 FIG. 15.6, 15.14

## Nervous System Histology, Brain, Cranial Nerves

**TABLE 7-10. Cranial nerves:** Cranial nerves are **not part of the CNS**. They are peripheral nerves (PNS) directly attached to the brain.

FIG. 15.24, TABLES 15.7, 15.8

NUMBER	NAME	FUNCTION (S = SENSORY; M = MOTOR)	FORAMINA
<input type="checkbox"/> I	olfactory nerve	S = olfaction (smell)	cribriform plate of _____ bone
<input type="checkbox"/> II	optic nerve	S = vision	optic canal of _____ bone
<input type="checkbox"/> III	oculomotor nerve	M = <i>somatic motor</i> : four extrinsic eye muscles (medial rectus, superior rectus, inferior rectus, inferior oblique); opens eyelid <i>autonomic motor</i> : pupil constriction and focusing	superior orbital fissure of _____ bone
<input type="checkbox"/> IV	trochlear nerve	M = superior oblique eye muscle	superior orbital fissure
<input type="checkbox"/> V	trigeminal nerve	S = sensation from scalp, nose, face, mouth, touch on anterior part of tongue  M = chewing (mastication) muscles	<ul style="list-style-type: none"> <li>• superior orbital fissure</li> <li>• foramen rotundum of _____ bone</li> <li>• foramen ovale of _____ bone</li> </ul>
<input type="checkbox"/> VI	abducens nerve	M = <i>somatic motor</i> : lateral rectus eye muscle	superior orbital fissure
<input type="checkbox"/> VII	facial nerve	S = taste from anterior two-thirds of tongue M = <i>somatic motor</i> : muscles of facial expression <i>autonomic motor</i> : lacrimal gland, submandibular and sublingual salivary glands	internal acoustic meatus of _____ bone
<input type="checkbox"/> VIII	vestibulocochlear nerve	S = hearing (cochlear branch); equilibrium (vestibular branch)	internal acoustic meatus

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**TABLE 7-10. Cranial nerves:** Cranial nerves are **not part of the CNS**. They are peripheral nerves (PNS) directly attached to the brain.

FIG. 15.24, TABLES 15.7, 15.8

NUMBER	NAME	FUNCTION (S = SENSORY; M = MOTOR)	FORAMINA
<input type="checkbox"/> IX	glossopharyngeal nerve	S = touch and taste on posterior 1/3 of tongue M = <i>somatic motor</i> : swallowing <i>autonomic motor</i> : parotid salivary gland	jugular foramen of _____ bone
<input type="checkbox"/> X	vagus nerve	S = sensation from heart, lungs, most abdominal organs; sensation from ear M = <i>somatic motor</i> : speech <i>autonomic motor</i> : motor function of heart, lungs, and most abdominal organs	jugular foramen
<input type="checkbox"/> XI	accessory nerve	M = trapezius muscle; sternocleidomastoid muscle	<ul style="list-style-type: none"> <li>• foramen magnum of _____ bone</li> <li>• jugular foramen</li> </ul>
<input type="checkbox"/> XII	hypoglossal nerve	M = tongue muscles	hypoglossal canal of _____ bone

## INSTRUCTIONS FOR SHEEP BRAIN DISSECTION

**Before you begin the dissection, you will need to obtain a dissecting tray, scalpel, and sheep brain from your instructor or the laboratory assistant. YOU MUST WEAR GLOVES FOR THIS DISSECTION.**

1. Observe the gross anatomical structures of the sheep brain (nerves, **dura mater**, blood vessels, etc.). Note how tough the dura mater is.
  - a. Place the sheep brain on the tray so the inferior surface is facing up. Identify the *optic chiasm*.
  - b. Find the *pituitary gland*, if present (notice the capillary beds both posteriorly and lateral to the pituitary gland).
  - c. Find the *trigeminal nerves (CNV)*.
2. **Carefully remove the dura mater without breaking off the pituitary gland.** Note: If the sheep brain doesn't have dura mater skip to step 2f.
  - a. Cut the trigeminal nerves and the capillaries away from the *pituitary gland*.
  - b. Next, cut around the optic chiasm, pituitary gland, and trigeminal nerve.
  - c. Gently lift the dura mater on the posterior side of the pituitary gland until you can see the small nerves that go through the deep surface of the dura mater.
  - d. Use your scalpel to detach the nerves at the point where they enter the dura mater. Make sure you are cutting the nerve where it comes in contact with the dura, not where it attaches to the brain!
  - e. Now make a cut in the dura mater between the *olfactory bulbs and olfactory tracts*. Gently pull the dura mater away from the brain. The best way to do this is to pull the dura in a posterior, superior direction. Be sure to gently cut any remaining connections as you pull the dura mater away from the brain.
  - f. Remove as much of the dura as possible, making sure you keep the pituitary gland intact.

## IDENTIFY THE FOLLOWING STRUCTURES ON THE SHEEP BRAIN

INFERIOR VIEW		
<input type="checkbox"/> cerebellum	<input type="checkbox"/> medulla oblongata	<input type="checkbox"/> pituitary gland
<input type="checkbox"/> cerebral peduncle	<input type="checkbox"/> olfactory bulb	<input type="checkbox"/> pons
<input type="checkbox"/> frontal lobe	<input type="checkbox"/> optic chiasm	<input type="checkbox"/> temporal lobe
<input type="checkbox"/> longitudinal fissure	<input type="checkbox"/> optic nerve (CN II)	<input type="checkbox"/> hypothalamus

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- g. Next, observe the *mammillary body*, a part of the *hypothalamus*. Do this by carefully lifting the pituitary gland. Note: The human brain has two mammillary bodies but the sheep brain only has one.
  - h. Now identify the *cranial nerves*. Note: Cranial nerves IX–XII might not be visible because they might have been torn off when the brain was being removed from the skull.
3. **Superior view of the sheep brain:** Place the brain on the dissecting tray so the superior side is facing up. Notice the thin layer of *arachnoid* that covers the surface of the brain but does not dip into the sulci of the brain. Also notice the vast amounts of blood vessels that are between the arachnoid mater and the pia mater. The space the blood vessels occupy is the *subarachnoid space* where cerebrospinal fluid flows in the sheep.

## Identify the Following Structures on the Sheep Brain

SUPERIOR VIEW		
<input type="checkbox"/> arachnoid (mater)	<input type="checkbox"/> cerebrum	<input type="checkbox"/> spinal cord
<input type="checkbox"/> blood vessels	<input type="checkbox"/> gyrus	<input type="checkbox"/> sulcus
<input type="checkbox"/> cerebellum	<input type="checkbox"/> longitudinal fissure	<input type="checkbox"/> cerebral cortex

Now, pick up the brain, hold it with the cerebellum facing you, and carefully pull the cerebellum away from the cerebrum.

POSTERIOR VIEW		
<input type="checkbox"/> cerebellum	<input type="checkbox"/> inferior colliculi*	<input type="checkbox"/> pineal gland
<input type="checkbox"/> cerebrum	<input type="checkbox"/> superior colliculi*	

\*superior colliculi + inferior colliculi = corpora quadrigemina

## *Midsagittal and Coronal Sections of the Sheep Brain*

**Note:** Some of you will dissect a midsagittal section of the sheep brain, and some will dissect a coronal section. Ask your instructor which section you are to dissect before you begin cutting. Make sure you observe both dissections, even though you are only performing one.

### **Midsagittal Section**

1. Place the sheep brain on your dissecting tray with its superior surface facing you. Starting on the anterior end, place your scalpel in the *longitudinal fissure* and cut the brain in half along the midsagittal plane.
2. Once you have cut the brain in half down the longitudinal fissure, identify the following structures on the cut, midsagittal surface.

## Nervous System Histology, Brain, Cranial Nerves

MIDSAGITTAL SECTION		
<input type="checkbox"/> central canal	<input type="checkbox"/> fornix	<input type="checkbox"/> pituitary gland
<input type="checkbox"/> cerebellum	<input type="checkbox"/> fourth ventricle	<input type="checkbox"/> pons
<input type="checkbox"/> cerebral aqueduct	<input type="checkbox"/> mammillary body	<input type="checkbox"/> spinal cord
<input type="checkbox"/> cerebral peduncle	<input type="checkbox"/> medulla oblongata	<input type="checkbox"/> superior and inferior colliculi
<input type="checkbox"/> cerebrum	<input type="checkbox"/> optic chiasm	<input type="checkbox"/> thalamus, with interthalamic adhesion
<input type="checkbox"/> corpus callosum	<input type="checkbox"/> pineal gland	<input type="checkbox"/> septum pellucidum

### Coronal section

1. Place the sheep brain on your dissection tray with the inferior side facing you. Identify the pituitary gland. Use your scalpel to cut the brain in half along a coronal plane.
2. Once you have cut the brain in half, identify the following structures on the cut surface.

CORONAL SECTION		
<input type="checkbox"/> cerebral peduncle	<input type="checkbox"/> hypothalamus	<input type="checkbox"/> pons
<input type="checkbox"/> cerebrum	<input type="checkbox"/> thalamus	<input type="checkbox"/> third ventricle
<input type="checkbox"/> corpus callosum	<input type="checkbox"/> lateral ventricles	<input type="checkbox"/> cerebral nuclei
<input type="checkbox"/> fornix	<input type="checkbox"/> longitudinal fissure	<input type="checkbox"/> cerebral cortex

**YOU MUST DISPOSE OF THE SHEEP AS INSTRUCTED, AND COMPLETELY CLEAN, DRY, AND PUT AWAY ALL INSTRUMENTS AND TRAYS IN ORDER TO EARN YOUR PARTICIPATION GRADE FOR THE LAB.**



# Activity 7

## STUDY AIDS FOR NERVOUS SYSTEM I

Helpful terms for Nervous System I

ANATOMICAL TERMS	DESCRIPTION
<b>abducens</b>	to take away (as in abduction)
<b>aqueduct</b>	channel for conducting fluid
<b>arachnoid</b>	like a spider web
<b>arbor vitae</b>	tree of life
<b>axon</b>	axis
<b>callosum</b>	callum= tough
<b>chiasm/chiasma</b>	cross
<b>colliculus</b>	hill
<b>corpus/corpora</b>	body
<b>dendrite</b>	a tree, like branches of a tree
<b>denticulate</b>	tooth, small tooth-like projections
<b>dura</b>	tough
<b>falx</b>	sickle-shaped
<b>filum</b>	a thread
<b>fissure</b>	a cleft
<b>fornix</b>	arch
<b>glossal</b>	tongue
<b>gyrus</b>	circle, coil of brain cortex
<b>mater</b>	mother, pertaining to the meninges of the brain
<b>matter</b>	substance(s) an object or structure is made of
<b>neurolemma</b>	covering layer of a nerve
<b>olfactory</b>	pertaining to smell
<b>optic</b>	pertaining to sight
<b>pia</b>	gentle or faithful, the faithful membrane that follows the contours
<b>pineal</b>	a pine cone
<b>pituitary</b>	mucous; gland was believed to secrete mucous through the nose
<b>quadrigemina</b>	four twins
<b>septum</b>	wall, partition
<b>sulcus</b>	a groove
<b>tentorium</b>	tent
<b>trigeminal</b>	triplets
<b>trochlear</b>	a pulley
<b>vagus</b>	wanderer
<b>vermis</b>	worm