

CVM 6120 Neuroanatomy Lab Terms List

Note: Items shown in small type are less likely to appear on exams than are items in regular type. Indentations are used to indicate subdivision relationships.

LAB 1 - Nervous Tissue Histology

Neurons

- perikaryon
 - nucleus
 - nucleolus
 - Nissl substance
(= cytoplasmic RER)
- axon
- dendrites
- unipolar (pseudo-unipolar) neuron
- bipolar neuron
- multipolar neuron
 - Purkinje cells
(of cerebellar cortex)

Neuroglia (CNS Neuroglia)

- astrocytes
 - (fibrous & protoplasmic types)
- oligodendroglia (oligodendrocytes)
- microglia
- neuropil

Peripheral Nerves

- epineurium
- perineurium (surrounds nerve fascicle)
 - fibrous perineurium
 - perineural epithelium
- endoneurium
- myelinated nerve fibers
- lemmocytes
 - lemmocyte cytoplasm
 - myelin sheath (myelin neurokeratin)
 - myelin node (node of Ranvier)
- non-myelinated nerve fibers
- spinal ganglion
 - unipolar neurons
 - satellite lemmocytes
- autonomic ganglion
 - postganglionic multipolar neurons
- receptors
 - Pacinian corpuscle

Spinal Cord

- central canal
 - ependymal cells
- white matter
 - funiculi (dorsal, lateral, & ventral)
- gray matter
 - dorsal & ventral gray horns
 - motor neurons in ventral horn
(= somatic efferent neurons)

Meninges and Spinal Roots

- pia mater
 - denticulate ligament
- arachnoid (arachnoid membrane)
 - subarachnoid space
- dura mater
- spinal roots (dorsal & ventral)

LAB 2 - Spinal Cord

Spinal Cord Gross Anatomy

- spinal roots (dorsal & ventral)
 - spinal rootlets
 - spinal ganglion (on dorsal root)
 - cauda equina
- spinal segments

Spinal Cord Histology

Surface Features:

- ventral median fissure
- dorsal median sulcus
 - dorsal median septum (or fissure)
- dorsolateral sulcus (dorsal rootlet entry)

Gray Matter:

- dorsal horn
 - marginal nucleus (lamina I)
 - substantia gelatinosa (lamina II)
 - nucleus proprius
 - nucleus thoracicus
- intermediate substance
 - intermediolateral nucleus (lateral horn)
- ventral horn
 - motor nuclei (somatic efferent neurons; motor neurons)
- central canal
 - ependymal cells

White Matter:

- dorsal funiculus
 - dorsal rootlet fibers
 - cranial & caudal branches
 - dorsolateral fasciculus (small fibers)
- lateral funiculus
- ventral funiculus
 - ventral rootlet fibers
- spinal tracts
 - fasciculus proprius

Spinal Meninges:

- dura mater
 - epidural space
- arachnoid
 - subarachnoid space
 - cerebrospinal fluid
- pia mater
 - denticulate ligament

Spinal Pathways

- descending pathways*
- ascending pathways
 - primary afferent neuron

Pain & Temperature Pathways:

- dorsolateral fasciculus
- marginal nucleus & nucleus proprius
 - spinothalamic tract
 - spinocervicothalamic tract
- lateral cervical nucleus (C1&2)

Touch & Kinesthesia Pathway:

- fasciculus gracilis
 - nucleus gracilis (brainstem)
- fasciculus cuneatus
 - medial cuneate nucleus (brainstem)

LAB 3 - Brain

Brain Divisions

Forebrain

Telencephalon (cerebrum)

Diencephalon

Midbrain

Mesencephalon (midbrain)

Hindbrain

Metencephalon (pons & cerebellum)

Myelencephalon (medulla oblongata)

Also...

cerebrum

cerebellum

brainstem

Telencephalon (Cerebrum)

cerebral hemisphere

Lobes:

frontal

occipital

temporal

parietal

cerebral cortex (neocortex vs paleocortex)

gyrus (gyri = plural)

cingulate gyrus

sulcus (sulci = plural)

cruciate sulcus

coronal sulcus

white matter

corpus callosum

internal capsule

basal nuclei

caudate nucleus

lateral ventricle

interventricular foramen

choroid plexus

Rhinencephalon:

olfactory bulb

lateral olfactory tract

rostral commissure

piriform lobe

septum

hippocampus

fornix

Diencephalon

third ventricle

pineal gland (in sheep)

thalamus

interthalamic adhesion

lateral geniculate body (nucleus)

medial geniculate body (nucleus)

hypothalamus

optic nerve

optic chiasm (chiasma)

optic tract

mamillary bodies

Mesencephalon

mesencephalic aqueduct

periaqueductal gray matter (PAG)

tectum

rostral colliculus (colliculi = plural)

caudal colliculus

substantia nigra

crus cerebri

oculomotor nerve

trochlear nerve

Metencephalon

Pons

trigeminal nerve

pontine nuclei

transverse pontine fibers

middle cerebellar peduncle

fourth ventricle

Cerebellum

vermis & hemispheres

cortex

folium (folia = plural)

sulcus (sulci = plural)

white matter

cerebellar nuclei

cerebellar peduncles

rostral, middle, & caudal

Myelencephalon

fourth ventricle

choroid plexus

cranial nerves (VI through XII)

trapezoid body

dorsal nucleus of the trapezoid body

pyramids

olivary nucleus

nucleus gracilis

medial cuneate nucleus

LAB 4 - Cranial Nerves

Forebrain

- olfactory nerve (I)
 - olfactory bulb
- optic nerve (II)
 - optic chiasm (chiasma)
 - optic tract

Midbrain

- oculomotor nerve (III)
 - oculomotor nucleus
 - parasympathetic nucleus of III
- trochlear nerve (IV)
 - trochlear nucleus

Hindbrain

- trigeminal nerve (V)
 - motor nucleus of the trigeminal n.
 - pontine nucleus of the trigeminal n.
 - spinal tract of V
 - nucleus of the spinal tract of V
- abducent nerve (VI)
 - abducent nucleus
- facial nerve (VII)
 - motor nucleus of the facial n.
 - genu of the facial nerve
- vestibulocochlear nerve (VIII)
- glossopharyngeal nerve (IX)
 - solitary tract
 - nucleus of the solitary tract
- vagus nerve (X)
 - parasympathetic nucleus of the vagus n.
 - nucleus ambiguus
- accessory nerve (XI)
 - spinal root of the accessory n.
- hypoglossal nerve (XII)
 - hypoglossal nucleus

Fiber types:

- SE = somatic efferent
- VE = visceral efferent
- GSA = general somatic afferent
- SSA = special somatic afferent
- GVA = general visceral afferent
- SVA = special visceral afferent

LAB 4 - Vestibular System

Labyrinth (inner ear)

- cochlea
- vestibular apparatus
- bony labyrinth
 - vestibule
 - semicircular canal (3)
- membranous labyrinth
 - utricle or saccule
 - macula
 - otolith membrane
 - semicircular duct (3)
 - crista ampullaris
- vestibulocochlear nerve
 - cochlear nerve
 - vestibular nerve
 - vestibular ganglion

Brainstem

- vestibular nuclei
- medial longitudinal fasciculus

Cerebellum

- nodulus & flocculus

LAB 5 – Auditory System

Cochlea

- scala vestibuli
 - (contacts oval (vestibular) window)
- scala tympani
 - (contacts round (cochlear) window)
- cochlear duct (scala media)
 - vestibular membrane
 - stria vascularis
 - basilar membrane
 - osseous spiral lamina
- spiral organ (organ of Corti)
 - reticular membrane
 - inner & outer hair cells
- tectorial membrane
- cochlear nerve fibers
 - spiral ganglion

Auditory Pathway

- cochlear nerve (vestibulocochlear nerve)
- nuclei / gray matter:*
 - cochlear nuclei (dorsal & ventral)
 - dorsal nucleus of the trapezoid body
 - caudal colliculus
 - medial geniculate nucleus (body)
 - primary auditory area of cerebral cortex
- tracts / fiber bundles:*
 - trapezoid body (fibers)
 - lateral lemniscus
 - brachium of the caudal colliculus
 - internal capsule
 - cerebral white matter

LAB 5 – Visual System

Eyeball

- fibrous tunic
 - cornea
 - sclera
- vascular tunic (uvea)
 - iris
 - ciliary body
 - zonular fibers to lens
 - choroid
 - tapetum lucidum
- retina
 - pars iridica
 - pars ciliaris
 - pars optica
 - histology:*
 - pigmented epithelium
 - photoreceptor cells (rods & cones)
 - bipolar cells
 - ganglion cells
 - regions:*
 - area centralis (visual streak)
 - optic disc
 - optic nerve
- aqueous humor
 - in anterior & posterior chambers
- lens
- vitreous body

Visual Pathway

- optic nerve
- optic chiasm (chiasma)
- optic tract
- conscious pathway:*
 - optic tract
 - lateral geniculate nucleus (body)
 - internal capsule
 - primary visual area of cerebral cortex
 - occipital lobe
- reflex pathways:*
 - optic tract
 - brachium of the rostral colliculus
 - rostral colliculus (orientation reflex)
 - pretectal region (pupillary reflex)
 - caudal commissure
 - parasympathetic nucleus of oculomotor nerve

LAB 6 - Cerebral Cortex

Neocortex

- white matter (deep to the cortex)
- gyrus (gyri)
 - postcruciate gyrus
- sulcus (sulci)
 - cruciate sulcus
 - coronal sulcus
- cerebral cortex (*microanatomy*)
 - pyramidal cells
 - granule cells
 - six layers:*
 - I - molecular layer
 - II – outer granule cell layer
 - III – outer pyramidal layer
 - IV - inner granule cell layer
 - V - inner pyramidal layer
 - VI - multiform layer

Functional areas

- motor area
- somesthetic (somatosensory) area
- visual area
- auditory area
- vestibular area

LAB 6 - Motor Centers

Cerebral Cortex

- premotor area
- motor area
- pyramidal tract
 - cerebral white matter
 - internal capsule
 - crus cerebri
 - longitudinal fibers of pons
- pyramids
 - pyramidal decussation
 - lateral corticospinal tract

Motor Nuclei

- basal nuclei
 - accumbens nucleus
 - caudate nucleus
 - putamen
 - globus pallidus (pallidum)
- subthalamus
- substantia nigra
- red nucleus
 - rubrospinal tract
- reticular formation
- extra-pyramidal tracts

LAB 7 - Cerebellum

Gross Features

Cerebellum

- sulcus (pl = sulci)
- folium (pl = folia)
- cerebellar vermis
 - lobules
 - nodulus
 - fissures
- cerebellar hemisphere (bilateral)
 - flocculus
- cerebellar white matter
- cerebellar nuclei (bilateral)
 - fastigial nucleus
 - interpositus nucleus
 - lateral (dentate) nucleus
- cerebellar peduncles (bilateral)
 - rostral cerebellar peduncle
 - middle cerebellar peduncle
 - caudal cerebellar peduncle

Phylogenetic divisions:

- flocculonodular (archicerebellum)
- rostral lobe (paleocerebellum)
- primary fissure
- caudal lobe (neocerebellum)

Cerebellar Cortex

cortical layers:

- molecular layer
- Purkinje cell layer
- granule cell layer

cortical neurons:

- Purkinje cells
- granule cells
 - parallel fibers in molecular layer
- basket cells

cortical afferent fibers:

- mossy fibers
- climbing fibers

LAB 8 – Rhinencephalon & Limbic System

Rhinencephalon

lateral rhinal sulcus
rostral commissure
septal region (septum)
piriform lobe
 amygdaloid nucleus (amygdala)
hippocampus
 fornix
cortex:
 septum & piriform lobe (paleocortex)
 hippocampus (archicortex)

olfactory pathway:
 olfactory nerves
 olfactory bulb
 olfactory peduncle
 lateral olfactory tract
 (to piriform lobe & hippocampus)
 medial olfactory tract
 (to septal region)
 intermediate olfactory tract
 (to rostral commissure)

Limbic System

outer cortical rim:
 septal region (septum)
 cingulate gyrus
 parahippocampal gyrus
 piriform lobe

deep telencephalic structures:
 amygdaloid nucleus (amygdala)
 accumbens nucleus
 hippocampus
 fornix

diencephalic structures:
 habenular nucleus
 stria habenularis
 thalamus (rostral thalamus)
 hypothalamus
 mamillary nucleus (body)