

Name _____KEY_____

Lab Section _____

**Nsci 2100: Human Neuroanatomy
Examination 2**

On this page, write your name and lab section.

On your scantron answer sheet, enter your name (last name space first name), internet ID (X.500 name) and student number. Please do it now!!!

Lecture 12 brainstem

1. Where were the cerebral peduncles visible on the whole intact human brains that you studied in the lab?
 - A. ventral surface of the cerebral cortex
 - B. ventral surface of the hypothalamus
 - C. ventral surface of the midbrain
 - D. dorsal surface of the pons
 - E. The cerebral peduncles were not visible in the whole intact brain.
2. Which of the following best describes the location of the fourth ventricle in the human brain?
 - A. medulla only
 - B. medulla and pons only
 - C. medulla and midbrain only
 - D. midbrain and pons only
 - E. diencephalon only
3. To what does the red arrow point in the photograph of the human brainstem to the right?
 - A. dorsal columns
 - B. cerebellar peduncle
 - C. olive
 - D. basal pons
 - E. pyramids
4. Where is the red nucleus?
 - A. internal capsule
 - B. diencephalon
 - C. medulla
 - D. midbrain
 - E. spinal cord



Lecture 13 forebrain

5. With what major functional system are the neurons in the subthalamus involved?
 - A. autonomic system
 - B. motor system
 - C. endocrine system
 - D. regulating the flow of sensory information to the cerebral cortex
 - E. circadian rhythms

6. Some neurons of the thalamus release hormones into the blood that act on the pituitary gland.
True or false?
A. true
→ B. false
7. Primary somatosensory cortex is described as having how many cell layers?
→ A. 6
B. 5
C. 4
D. 4-6 depending on the dorsal/ventral position
E. 3-5 depending on the dorsal/ventral position
8. Which of the following statements regarding the hippocampus is NOT true?
A. The hippocampus has an important role in remembering events and places.
B. The hippocampus is a phylogenetically old part of cerebral cortex.
C. The hippocampus is described as having three layers.
→ D. The hippocampus is a major structure of the basal ganglia.
E. All of the statements above are true.

Lecture 14 cranial nerves

9. Which cranial nerve does not contain Schwann cells?
→ A. optic nerve (CN II)
B. oculomotor nerve (CN III)
C. glossopharyngeal nerve (CN IX)
D. vagus nerve (CN X)
E. accessory nerve (CN XI)
10. Cranial nerves can have one or more major functions. Which of the following is NOT a function of any cranial nerve?
A. general motor
B. general sensory
C. special sensory
→ D. sympathetic motor
E. parasympathetic motor
11. Which of the following nerves does NOT have axons that synapse with muscles attached to the eyeball?
A. abducens (CN VI)
B. trochlea (CN IV)
C. oculomotor (CN III)
→ D. optic (CN II)
12. Bell's Palsy is usually due to a problem with which cranial nerve?
→ A. facial (CN VII)
B. glossopharyngeal (CN IX)
C. abducens (CN VI)
D. hypoglossal (CN XII)
E. trigeminal (CN V)

Lecture 15 somatosensory I

13. What cranial nerve carries somatosensory information from most of the face?
- A. facial (CN VII)
 - B. glossopharyngeal (CN IX)
 - C. abducens (CN VI)
 - D. hypoglossal (CN XII)
 - E. trigeminal (CN V)
14. Most axons that run in the dorsal columns synapse in the ...
- A. dorsal horn of the spinal cord.
 - B. gracile and cuneate nuclei.
 - C. ventral posterior lateral (VPL) nucleus of the thalamus.
 - D. precentral gyrus of the cortex.
 - E. postcentral gyrus of the cortex.
15. All primary somatosensory receptor neurons have receptor proteins activated by some type of mechanical force. True or false?
- A. true
 - B. false
16. A stroke in the right ventral posterior lateral (VPL) nucleus of the thalamus is likely to result in an inability to detect what sensory modality where?
- A. pain on the left side and proprioception on the right side
 - B. pain on the right side and proprioception on the left side
 - C. pain on the right side and proprioception on the right side
 - D. pain on the left side and proprioception on the left side

Lecture 16 somatosensory II (from Dr. Honda)

17. Which of the following statements is TRUE?
- A. Nociceptors are preferentially sensitive to noxious stimuli.
 - B. Mechanical nociceptors have spot-like receptive fields.
 - C. Polymodal nociceptors have thresholds to noxious heat around 43-45° C.
 - D. Nociceptors can distinguish between noxious and innocuous events.
 - E. All of the above are true.
18. Which of the following statements about placebo-induced analgesia is TRUE?
- A. It is mediated by an endogenous analgesia system in the brainstem.
 - B. The analgesia depends on input from the cerebellum to the brainstem.
 - C. It is mediated by opioid receptors on peripheral terminals of nociceptors.
 - D. This analgesia system depends on axons of brainstem neurons that project to the frontal cortex.
 - E. It is effective 70-80% of the time.
19. Which of the following statements regarding the dorsal column pathway and spinothalamic pathway is TRUE?
- A. These two pathways project to cerebral cortex through different thalamic nuclei.
 - B. Their ascending axons travel together in the spinal cord.
 - C. These two pathways terminate in the same cortical region.
 - D. Axons of these two systems cross the midline of the nervous system at the same level.
 - E. More than one of the above are true.

20. Non-steroidal analgesic drugs (NSAIDS) such as ibuprofen and aspirin act primarily by ...
- A. activating opioid receptors in the periaqueductal gray (PAG).
 - B. blocking the production of pain-producing substances such as prostaglandin.
 - C. activating cannabinoid receptors in the brain.
 - D. inhibiting spinal thalamic tract (STT) neurons.
 - E. all of the above.

Lecture 17 & 18 vision

21. Which of the following is most important for focusing the visual image on your retina?
- A. lens
 - B. pupil
 - C. iris
 - D. cornea
 - E. ciliary body
22. The retina partly surrounds what chamber of the eye?
- A. vitreous chamber
 - B. posterior chamber
 - C. anterior chamber
 - D. choroid chamber
 - E. pupillary chamber
23. What retinal cell type is in contact with retinal pigment epithelial (RPE) cells?
- A. bipolar cells
 - B. amacrine cells
 - C. horizontal cells
 - D. ganglion cells
 - E. photoreceptor cells
24. The fovea is a unique area of the retina. Which of the following is NOT a feature of the fovea?
- A. There are no blood vessels in the retina here.
 - B. There are mostly rod photoreceptors here.
 - C. There is no optic fiber layer here.
 - D. The main purpose of the muscles attached to the eye is to point the eyes so that the most interesting part of the visual image falls here.
25. In humans, which retinal axons cross the midline of the brain in the optic chiasm?
- A. all retinal axons
 - B. only retinal axons carrying information from the central visual field
 - C. only retinal axons carrying information from the peripheral visual fields
 - D. only retinal axons coming from the nasal side of the retinas
 - E. only retinal axons coming from the temporal side of the retinas
26. The suprachiasmatic nucleus has an important role in what function?
- A. recognizing an object using vision
 - B. regulating circadian rhythms
 - C. regulating the diameter of the pupil
 - D. moving the eyes
 - E. identifying a smell

27. Starting at the retina, where are the first neurons in the visual pathway that are binocular?
- A. lateral geniculate nucleus
 - B. optic chiasm
 - C. layer IV of primary visual cortex
 - D. layers II/III of primary visual cortex
 - E. cortical area 18
28. Which of the following statements best describes the visual information routed into parietal cortex?
- A. This information is first relayed to the brain by axons of M-type ganglion cells.
 - B. This information is critical for recognizing your mother by sight.
 - C. Color information is processed here.
 - D. More than one of the above are correct.

Lecture 19 auditory & vestibular

29. Which of the following is NOT air filled in a normal healthy person?
- A. external auditory meatus (ear canal)
 - B. middle ear
 - C. eustachian tube
 - D. More than one of the above are NOT air filled.
 - E. All of the above ARE air filled.
30. Normal hearing requires three small bones that are in the ...
- A. external auditory meatus (ear canal)
 - B. middle ear.
 - C. lateral ear.
 - D. inner ear.
 - E. eustachian tube.
31. Vestibular sensory information from the thalamus is carried mainly to what region of cortex?
- A. frontal lobe
 - B. temporal lobe
 - C. occipital lobe
 - D. parietal lobe
 - E. cingulate gyrus
32. Hair cells activated by sound are in the ...
- A. middle ear.
 - B. semicircular canal.
 - C. cochlea.
 - D. saccule.
 - E. More than one of the above are correct.

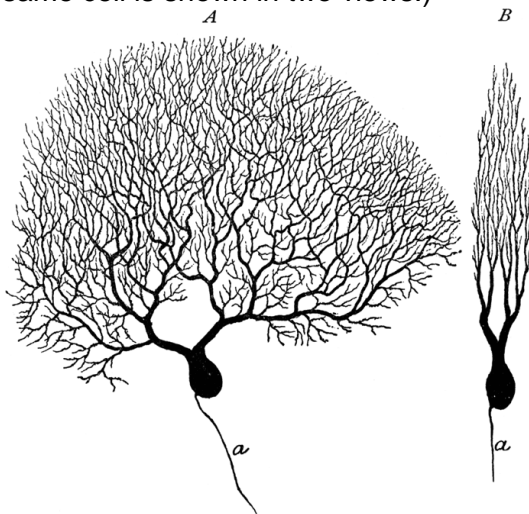
Lecture 20 chemical senses

33. The umami taste receptors are activated mainly by food with what characteristic?
- A. high sugar content
 - B. high protein content
 - C. high salt content
 - D. high starch content
 - E. high alcohol content

34. Sensory information detected on one side of the body is typically relayed to the contralateral (opposite) side of cerebral cortex or to both sides. Which of the following sensory systems is sent only to the ipsilateral (same) side of cerebral cortex?
- A. vision
 - B. hearing
 - C. olfaction
 - D. somatosensory
 - E. More than one of the above are correct.
35. Taste, olfactory and somatosensory information comes together in what region of the cerebral cortex?
- A. Insula
 - B. orbitofrontal cortex
 - C. prefrontal cortex
 - D. parietal lobe
 - E. These three systems never come together.
36. In which sensory system is information organized in the brain according to the nature of the stimulus rather than a physical map of their receptors?
- A. vision
 - B. hearing
 - C. olfaction
 - D. somatosensory
 - E. All of the above systems are organized according to a physical map of their receptors.

Lab #3-5 (from Dr. Riedl)

37. Which brain region is the most likely location for the drawing of the cell shown below? (The same cell is shown in two views.)



- A. neocortex
- B. medulla
- C. hypothalamus
- D. cerebellum
- E. hippocampus

38. Which of the following histological staining methods is most helpful for visualizing dendritic spines?
- A. Prussian Blue
 - B. Nissl stain
 - C. Golgi
 - D. Weigert
 - E. cresyl violet
39. The resting membrane potential of a cell is closest to the equilibrium potential of which of the following ions?
- A. potassium
 - B. calcium
 - C. chloride
 - D. sodium
40. The rising phase of a neuronal action potential is generated by the influx of which of the following ions?
- A. potassium
 - B. calcium
 - C. chloride
 - D. sodium

The End!

Please turn in this exam and your bubble sheet in the box at the back of the room.

Double check that your name is on both.