On this page, write your name and lab section.

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

Lecture 2 overview
1. A commissure is a …
   A. group of axons in the central nervous system (CNS).
   B. group of axons in the peripheral nervous system (PNS).
   C. group of neurons in the CNS.
   D. group of neurons in the PNS.
   E. structure in the brain that produces cerebrospinal fluid (CSF).

2. Which of the following BEST describes the location of the occipital cortex in the brain?
   A. anterior
   B. posterior
   C. dorsal
   D. ventral

3. Which of the following is NOT visible on the ventral surface of the intact human brain?
   A. cerebral cortex
   B. thalamus
   C. pons
   D. midbrain
   E. medulla

4. What is a raised area of the cerebral cortex called? (Some might think of these areas as the hills between valleys.)
   A. sulcus
   B. gyrus
   C. fissure
   D. tract
   E. nucleus

5. The pons is …
   A. rostral to the medulla
   B. caudal to the spinal cord
   C. rostral to the thalamus
Lecture 3 development
6. Thalamus develops from which primary brain vesicle?
   → A. forebrain (prosencephalon)
      B. midbrain (mesencephalon)
      C. hindbrain (rhombencephalon)
      D. optic vesicle

7. Neurons in autonomic ganglia develop from …
   A. alar plate
   B. basal plate
   C. roof plate
   D. floor plate
   → E. neural crest

8. Spina bifida …
   → A. can result from blockage in the cerebral aqueduct.
      B. can be largely prevented by taking folic acid (vitamin B9) during pregnancy.
      C. in its most severe form is a failure of the forebrain to close.
      D. is a rare condition that usually first appears in 20 to 30 year olds.
      E. is a disease of the neural crest.

9. What is the insula?
   → A. a part of the spinal cord
      B. a part of the pons covered by the cerebellum
      C. a part of the cerebellum covered by the pons
      D. a part of cerebral cortex covered by the temporal lobe
      E. a part of thalamus covered by the hypothalamus

Lecture 4 ventricles, CSF & meninges
10. What is the tissue attached to the inner surface of the skull bone called?
    → A. skin
       B. ependyma
       C. choroid plexus
       D. pia
       E. dura

11. The ventricles in the adult brain are filled with …
    → A. air
       B. cerebrospinal fluid
       C. venous blood
       D. axons
       E. astrocytes

12. The tentorium cerebelli is between the …
    → A. cerebral cortex and cerebellum.
       B. cerebral cortex and thalamus.
       C. cerebral cortex and pons.
       D. cerebellum and pons.
       E. pons and medulla.
13. Many headaches are due to activation of pain receptors broadly distributed among the neurons of the cerebral cortex, particularly in the frontal lobe. True or false?
   A. true
   B. false

14. The cerebrospinal fluid outside the brain is present between what two tissues?
   A. brain and pia
   B. pia and choroid plexus
   C. dura and arachnoid
   D. arachnoid and pia
   E. dura and skull

Lecture 5 blood supply
15. What is the name of the large artery that leaves the heart and branches of which carry oxygenated blood to the brain?
   A. vena cava
   B. aorta
   C. pulmonary
   D. atrium
   E. cardiac

16. What chamber of the heart first receives deoxygenated blood returning from the body?
   A. right atrium
   B. left atrium
   C. right ventricle
   D. left ventricle
   E. right pulmonary

17. What major artery is most important for supplying blood to the frontal cortex?
   A. vertebral
   B. basilar
   C. internal carotid
   D. circle of Willis
   E. internal jugular

18. Venous blood from the brain drains mainly into the subarachnoid space from where it is collected into large veins that leave the cranium. True or false?
   A. true
   B. false

19. A burst artery in the cerebral cortex results in …
   A. atherosclerosis
   B. ischemic stroke
   C. thrombosis
   D. hemorrhagic stroke
Lecture 6 cells
20. Which cell type normally is NOT found in the cerebellum?
   A. neuron
   B. oligodendrocyte
   C. astrocyte
   → D. schwann cell
   E. microglia

21. The cell membrane encases all parts of a neuron except ...
   A. the axon
   B. the dendrites
   C. the soma
   D. More than one of the above are correct (i.e. not covered by the cell membrane)
   → E. None of the above are correct since all parts are covered by the cell membrane.

22. Which of the following is true regarding the chromosomes in a normal human neuron?
   → A. Only males have one X and one Y chromosome.
   B. Only females have one X and one Y chromosome.
   C. Both males and females have one X and one Y chromosome.
   D. Males and females have two X chromosomes. Males also have one Y chromosome.
   E. Males and females have two X chromosomes. Females also have one Y chromosome.

23. Which of the following statements is true?
   → A. A strand of DNA is read by a ribosome and used to determine the sequence in which amino acids are linked together.
   B. A strand of DNA is read by a ribosome and used to determine the sequence in which nucleotides are linked together.
   C. A strand of mRNA is read by a ribosome and used to determine the sequence in which amino acids are linked together.
   D. A strand of mRNA is read by a ribosome and used to determine the sequence in which nucleotides are linked together.
   E. A strand of protein is read by a ribosome and used to determine the sequence in which amino acids are linked together.

Lecture 7 electrical properties
24. Action potentials decay in strength as they are propagated down the length of axons. However, they usually reach the end of the axon with sufficient strength to initiate transmitter release. True or false?
   → A. true
   B. false

25. Which of the following is TRUE regarding the resting membrane potential?
   → A. The sodium-potassium pump pumps sodium (Na⁺) out of the cell and potassium (K⁺) into the cell when a neuron is at rest.
   B. No energy is required to maintain the resting membrane potential.
   C. The concentration of chloride ion is higher inside of the cell than outside when the neuron is at rest, which is why the cell is said to have a negative charge.
   D. All ion channels are closed when the neuron is at rest.
26. An action potential is generated when …
   A. the initial segment of the axon becomes sufficiently hyperpolarized.
   B. the initial segment of the axon becomes sufficiently depolarized.
   C. the voltage-gated sodium (Na⁺) channels in the initial segment of the axon close.
   D. the membrane potential for most neurons reaches approximately -65mV.
   E. More than one of the above is true.

27. The refractory period for a neuron …
   A. is the time when threshold has been reached and an action potential is about to be generated.
   B. is the time during which the soma of a neuron is depolarized.
   C. is the time needed for synaptic vesicles to be recycled in a presynaptic terminal.
   D. limits how often the cell can have an action potential.
   E. is only seen in cells with myelinated axons.

Lecture 8 synaptic communication
28. SNARE proteins are required …
   A. in the initial segment of an axon for the generation of action potentials.
   B. in the synaptic terminal for release of neurotransmitter.
   C. in the synaptic cleft for degradation of neurotransmitter.
   D. in the dendrite for response to activation of excitatory neurotransmitter receptors.
   E. in the soma for synthesis of neurotransmitter.

29. Cocaine can function by blocking …
   A. action potentials.
   B. neurotransmitter release.
   C. neurotransmitter reuptake.
   D. neurotransmitter receptors.
   E. neurotransmitter synthesis.

30. Which of the following mechanisms is NOT typically used to clear neurotransmitter from the synaptic cleft?
   A. Neurotransmitter is taken up by the presynaptic terminal.
   B. Neurotransmitter is taken up by glial cells surrounding the synapse.
   C. Neurotransmitter is taken up by the postsynaptic neuron.
   D. Neurotransmitter is degraded by enzymes in the synaptic cleft.
   E. All of the mechanisms above are typically used by neurons.

31. Metabotropic receptors are used for excitatory synapses, and ionotropic receptors are used for inhibitory synapses. True or false?
   A. true
   B. false

Lecture 9 spinal cord
32. The spinocerebellar tract runs in what region of the spinal cord?
   A. ventral funiculus
   B. lateral funiculus
   C. dorsal funiculus
   D. central gray
   E. ventral horn
33. In the most direct pathway that carries somatosensory information to the cortex, the primary sensory neuron synapses with a relay neuron. This relay neuron has an axon that crosses the midline and ultimately synapses with neurons in what region of the CNS?
   A. primary somatosensory cortex
   B. somatosensory nuclei in the medulla
   C. somatosensory nuclei in the thalamus
   D. dorsal horn of the spinal cord
   E. ventral horn of the spinal cord

34. The patellar tendon stretch reflex involves axons of sensory neurons that synapse on what cells?
   A. motor neurons in the spinal cord only
   B. interneurons in the spinal cord only
   C. motor neurons and interneurons in the spinal cord
   D. motor neurons and interneurons in the spinal cord and relay neurons in the medulla

35. In what level of the spinal cord is the most white matter present?
   A. sacral
   B. cervical
   C. lumbar
   D. thoracic

Laboratory 1 & 2
36. What is the name of the plane of section indicated by the yellow line in the image below?
   A. coronal plane
   B. sagittal plane
   C. anterior plane
   D. tangential plane
   E. horizontal plane
37. Which statement is TRUE about the image below?
   A. This is a dorsal view of the sheep brain.
   B. ‘3’ labels the occipital lobe.
   C. ‘6’ labels the vermis of the cerebellum.
   D. ‘8’ labels the midbrain.
   E. ‘9’ labels the olfactory tract.

38. Which statement is FALSE about the drawing below?
   A. is the anterior cerebral artery.
   B. is the internal carotid artery.
   C. supplies blood to most of the medial surface of the brain.
   D. supplies blood to the caudal part of the cerebral cortex.
   E. is the vertebral artery.
39. What is the name of the structure indicated by the arrow in the image below?
   A. optic tract
   B. olfactory tract
   C. optic nerve
   D. corpus callosum
   E. oculomotor nerve

40. Which statement is FALSE about the images below?
   A. 1 is surrounded by the telencephalon
   B. 2 is surrounded by the diencephalon.
   C. 3 is surrounded by the thalamus.
   D. 4 is connected with the subarachnoid space via the foramen of Luschka.
   E. 6 is a fiber tract that connects the cerebellum and the brainstem.

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.