

The Human Nervous System

- Which of the following is not part of the fore-brain?
 - thalamus
 - cerebrum
 - corpus callosum
 - substantia nigra
- Terminal buttons are structures at the ends of...
 - dendrites
 - axons
 - the axon hillock
 - nodes of Ranvier
- Damage to the posterior section of the superior temporal gyrus in the dominant cerebral hemisphere is associated with
 - Wernicke's aphasia
 - Parkinson's disease
 - Broca's aphasia
 - apraxia of speech
- Damage to Broca's area would likely result in which of the following?
 - expressive aphasia
 - echolalia
 - palilalia
 - echopraxia
- A patient suffering from a brain tumor has lost motor function in his left leg. However, he still maintains sensation in that part. Of the following, which is the most likely site of the tumor?
 - right frontal lobe
 - left parietal lobe
 - occipital lobe
 - right temporal lobe
- All of the following brain structures are part of the limbic system except the
 - hippocampus
 - amygdala
 - hypothalamus
 - reticular formation
- Which of the following is the chief inhibitory neurotransmitter in the central nervous system?
 - acetylcholine
 - serotonin
 - GABA
 - dopamine
- Which of the following is the most likely consequence of the bilateral lesion of the amygdalae in monkey?
 - reduction of fear
 - uncontrolled appetite
 - loss of vision
 - impaired motor function
- A typical split-brain patient
 - finds it difficult to speak about objects in certain portions of their field of vision
 - suffers from abnormal difficulty in solving abstract problems
 - experiences a permanent loss of muscle coordination
 - cannot decipher the meaning of speech if sound perception is restricted to the right ear
- The area of the brain most responsible for encoding memory is the
 - hypothalamus
 - occipital lobe
 - medulla oblongata
 - hippocampus

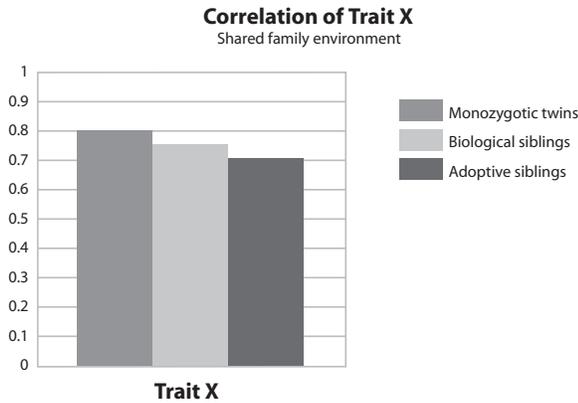
11. During nerve impulse transmission, at the peak of an action potential
- A. potassium channels open
 - B. the influx of potassium ions decreases
 - C. sodium channels close
 - D. the rate of efflux of sodium ions is maximized
12. The region of the cerebral cortex involved in the planning, control, and execution of voluntary movements is located in the
- A. frontal lobe
 - B. parietal lobe
 - C. temporal lobe
 - D. occipital lobe
13. The part of the parietal lobe that lies next to the motor cortex is the
- A. primary auditory cortex
 - B. central sulcus
 - C. somatosensory cortex
 - D. Wernicke's area
14. A stroke patient has difficulty remembering to shave the left side of his face. Of the following, which is the most likely site of damage?
- A. right frontal lobe
 - B. right parietal lobe
 - C. hippocampus
 - D. right amygdala
15. Which part of the cerebral cortex plays a central role in hearing, understanding language, and memory?
- A. frontal lobe
 - B. parietal lobe
 - C. temporal lobe
 - D. occipital lobe
16. Choose the two brain structures most closely associated with Parkinson's disease?
- A. substantia nigra and basal ganglia
 - B. hippocampus and frontal lobe
 - C. thalamus and primary motor cortex
 - D. precentral gyrus and reticular formation
17. On the way to the cerebral cortex, the vast majority of sensory information passes through the
- A. basal ganglia
 - B. basal forebrain
 - C. thalamus
 - D. reticular activating system
18. A construction worker notices a tool on the ground which had been misplaced earlier. Cognition of the tool occurs as sensory information reaches the cortex. The brain structure that contributes to the decision about how to respond and sends information to the motor cortex is the
- A. cerebellum
 - B. basal ganglia
 - C. pons
 - D. precentral gyrus
19. Which of the following is the main excitatory neurotransmitter in the central nervous system?
- A. glutamate
 - B. norepinephrine
 - C. GABA
 - D. anandamide

20. All of the following are monoamine neurotransmitters except
- A. acetylcholine
 - B. norepinephrine
 - C. dopamine
 - D. serotonin
21. Dopamine is not synthesized within the central nervous system by cells of the
- A. ventral tegmental area
 - B. hypothalamus
 - C. substantia nigra
 - D. adrenal medulla
22. The equilibrium potential across a typical nerve cell membrane is the same as the resting potential for which ion?
- A. sodium
 - B. potassium
 - C. chloride
 - D. calcium
23. For a neuron with a resting membrane potential of -70mV , a typical threshold potential would be approximately
- A. -90mV
 - B. -55mV
 - C. -10mV
 - D. $+20\text{mV}$
24. At the peak of an action potential
- A. the membrane hyperpolarizes
 - B. sodium ion channels open, allowing the exit of sodium ions from the cell
 - C. sodium channels close
 - D. sodium ion channels open, allowing the entry of sodium ions into the cell
25. Which of the following would cause an EPSP?
- A. an increase in the post-synaptic membrane permeability for sodium ions
 - B. an increase in the post-synaptic membrane permeability for chloride ions
 - C. an increase in the post-synaptic membrane permeability for potassium ions
 - D. a decrease in the post-synaptic membrane permeability for calcium ions
26. In the brains of patients suffering from Alzheimer's disease
- A. damage affects dopamine production in the substantia nigra of the basal ganglia
 - B. loss of function and deterioration occurs with cholinergic neurons
 - C. a decrease in the number of astrocytes occurs due to the destruction of nearby neurons
 - D. white matter is demyelinated affecting the conduction of signals
27. Which of the following is the neurotransmitter in both sympathetic and parasympathetic ganglia?
- A. norepinephrine
 - B. acetylcholine
 - C. dopamine
 - D. glutamate
28. Which of the following is most associated with anterograde axonal transport?
- A. dynein
 - B. reuptake
 - C. kinesin
 - D. myosin

29. Nicotinic and muscarinic receptors respond to which of the following neurotransmitters?
- A. acetylcholine
 - B. dopamine
 - C. norepinephrine
 - D. GABA
30. Which type of CNS glial cell is most similar in function to Schwann cells?
- A. ependymal cells
 - B. astrocytes
 - C. microglia
 - D. oligodendroglia
31. Among the following which is the most likely result of a lesion to the occipital lobe
- A. scotoma
 - B. expressive aphasia
 - C. receptive aphasia
 - D. paresthesia of the left hand
32. A brain trauma patient suffers from integrative agnosia, meaning the lack of integrating perceptual wholes within knowledge. This symptom is most likely caused by lesions to the
- A. extrastriate cortex
 - B. somatosensory cortex
 - C. superior temporal gyrus
 - D. cingulate cortex
33. Phagocytic glial cells are called
- A. astrocytes
 - B. microglia
 - C. oligodendroglia
 - D. ependymal cells
34. Which of the following is the anatomical basis of spatial summation of multiple EPSPs?
- A. divergence
 - B. convergence
 - C. facilitation
 - D. presynaptic inhibition
35. Which of the following must be true regarding presynaptic inhibition?
- A. at least three neurons are involved
 - B. an ISPS is produced
 - C. increased chloride conductance in the terminal of the excitatory axon
 - D. modulation of voltage-gated Ca^{2+} channels
36. Morphine is an agonist of the brain neurotransmitter
- A. serotonin
 - B. glutamate
 - C. anandamine
 - D. endorphin
37. Extension of the big toe when the sole of the foot is stimulated is known as
- A. the Moro reflex
 - B. the Galant reflex
 - C. the Babinski sign
 - D. the rooting reflex
38. Compared to the right hemisphere, in the vast majority of people, the left hemisphere of the brain is more closely associated with
- A. pattern recognition
 - B. language processing
 - C. facial recognition
 - D. motion perception

39. If identical twins are more alike in a psychological characteristic than are fraternal twins then this characteristic is genetically influenced. Which of the following assumptions underlies this proposition?
- A. that fraternal twins are less alike genetically than ordinary singlet brothers and sisters
 - B. that epigenetic factors affecting development are more important than sequence homologies
 - C. that genetic influences on the psychological trait are more powerful than environmental influences
 - D. that environmental influences on the characteristics are the same in fraternal and identical twins
40. The embryonic structure from which the cerebrum develops prenatally is the
- A. telencephalon
 - B. diencephalon
 - C. mesencephalon
 - D. rhombencephalon
41. Which of the following structures does not develop prenatally from the prosencephalon?
- A. cerebrum
 - B. amygdala
 - C. thalamus
 - D. medulla
42. Research has shown which of the following changes in the brain to be associated with a history of child abuse or trauma?
- I. Increased limbic system sensitivity
 - II. Decreased hippocampal volume
 - III. Decreased frontal lobe activity
 - IV. Attenuated sympathetic activation
- A. I only
 - B. II only
 - C. I and IV
 - D. I, II, and III
43. Release of norepinephrine by the locus coeruleus, dopamine by the substantia nigra, serotonin by the dorsal raphe, and acetylcholine by the pedunculopontine nucleus are all examples of
- A. synaptic activation
 - B. presynaptic inhibition
 - C. neuromodulation
 - D. second messenger systems
44. Which of the following does not derive from ectoderm during embryonic development?
- A. notochord
 - B. neural tube
 - C. alar plate
 - D. neural crest
45. Of the following structures which is most functionally distinguished as a mediator of signals between the sensory cortex, association areas, and the motor cortex?
- A. corpus callosum
 - B. reticular activating system
 - C. basal ganglia
 - D. amygdala

46. The chart below illustrates a pattern of correlation for trait X among adolescent siblings in a shared family environment. The general population of adolescent children shows 45% correlation for trait X.



Trait X shows

- A. low shared environmental variance and low heritability
 - B. low shared environmental variance and high heritability
 - C. high shared environmental variance and low heritability
 - D. high shared environmental variance and high heritability
47. At birth, the neurons in the motor cortices of an infant have connections to the superior colliculus. In early childhood in normal development, however, the motor cortex severs these connections. This is an example of
- A. neurulation
 - B. synaptic pruning
 - C. use-it-or-lose-it
 - D. activity dependent plasticity

48. Syntaxin and synaptobrevin are anchored in respective membranes by their C-terminal domains, whereas SNAP-25 is tethered to the plasma membrane via several cysteine-linked palmitoyl chains. The formation described in the previous statement is

- A. a nicotinic acetylcholine receptor
- B. a GABA_A receptor
- C. excitatory amino acid transporter 2 (EAAT2)
- D. a SNARE complex

49. The role played by synaptotagmin in nerve impulse transmission is as

- A. a Ca²⁺ sensor
- B. a component of the core SNARE complex
- C. a connexon specialized for electrical synapses
- D. a neurotransmitter transporter

50. A stroke patient remains hospitalized in a coma. Of the following structures it is most likely the cerebral infarction affected her

- A. reticular formation
- B. amygdala
- C. hippocampus
- D. hypothalamus