



This instructional aid was prepared by the Learning Commons at Tallahassee Community College.

Neural Signaling Quiz

Directions: Choose the best answer to the questions below

1. A neuron that is not signaling and has a relatively more negatively charged intracellular membrane is considered to be _____.
 - a. at rest
 - b. depolarized
 - c. hyperpolarized
 - d. a graded neuron
2. What is the average resting membrane potential in a neuron?
 - a. 60 mV
 - b. 70 mV
 - c. -80 mV
 - d. -70mV
 - e. -60 mV
3. Resting membrane potential is _____ gradient which is caused by _____ gradient.
 - a. a chemical concentration, an electrical concentration
 - b. an electrical concentration, a chemical concentration
4. The intracellular concentration of Na^+ ions in a neuron at rest is _____, but the intracellular concentration of K^+ ions inside of a neuron at rest is _____.
 - a. 15 mmol/L, 150 mmol/L
 - b. 5 mmol/L, 115 mmol/L
 - c. 115 mmol/L, 15 mmol/L
 - d. 150 mmol/L, 5 mmol/L
5. The Na^+ and K^+ concentration gradient is established by
 - a. the Na^+ leak channel
 - b. the Na^+ / K^+ ATPase (Pump)
 - c. the K^+ Leak Channel
 - d. ALL are correct
 - e. ALL are correct except a

6. The Na^+ / K^+ ATPase (pump)

- a. moves 3 Na^+ out for every 3 K^+ in
- b. moves 2 Na^+ in for every 2 K^+ out
- c. moves 3 Na^+ out for every 2 K^+ in
- d. moves 3 Na^+ in for every 2 K^+ out

7. A stimulus occurs on the _____ of a neuron.

- a. axon
- b. axon terminal
- c. dendrite
- d. axon hillock
- e. nucleus

8. A stimulus always results in _____.

- a. an action potential
- b. a graded potential
- c. a neurotransmitter being released
- d. hyperpolarization of the neuron

9. A stimulus causes _____ ion channels to _____.

- a. Na^+ , Close
- b. Na^+ , Open
- c. K^+ , Close
- d. K^+ , Open

10. If _____ is achieved by a graded potential, then an action potential can occur.

- a. a concentration gradient
- b. an electrical gradient
- c. threshold
- d. depolarization in the dendrite

11. Which of the following lists the three phases of an action potential in the correct order?

- a. Repolarization, Depolarization, Hyperpolarization
- b. Depolarization, Hyperpolarization, Repolarization
- c. Hyperpolarization, Depolarization, Repolarization
- d. Depolarization, Repolarization, Hyperpolarization

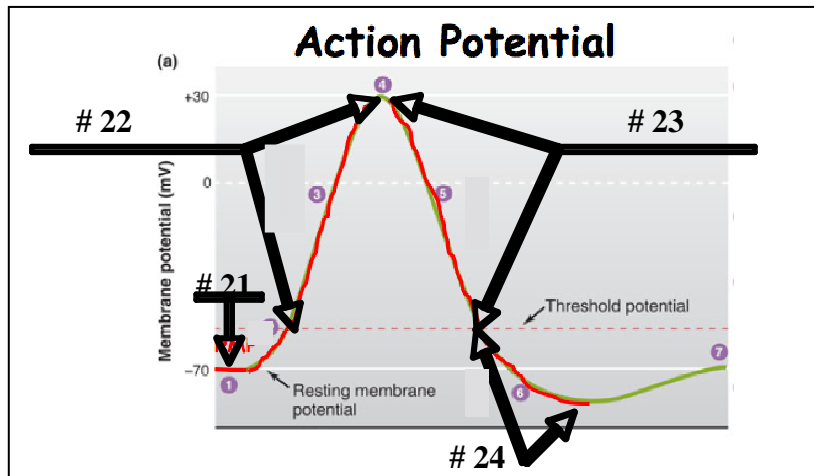
12. In Hyperpolarization, the intracellular membrane becomes slightly more _____.
- positive
 - negative
13. Hyperpolarization is caused by
- Na⁺ Channels being OPEN, and K⁺ Channels being CLOSED
 - Na⁺ Channels being CLOSED, and K⁺ Channels being OPEN
 - Na⁺ Channels being OPEN, and K⁺ Channels being OPEN
 - Na⁺ Channels being CLOSED, and K⁺ Channels being CLOSED
14. The membrane potential achieves a minimum intracellular charge of _____ during Hyperpolarization.
- 70 mV
 - 80mV
 - 30 mV
 - 60 mV
 - 80 mV
15. In Depolarization, the intracellular membrane becomes slightly more _____.
- positive
 - negative
16. Depolarization is caused by
- Na⁺ Channels being OPEN, and K⁺ Channels being CLOSED
 - Na⁺ Channels being CLOSED, and K⁺ Channels being OPEN
 - Na⁺ Channels being OPEN, and K⁺ Channels being OPEN
 - Na⁺ Channels being CLOSED, and K⁺ Channels being CLOSED
17. The membrane potential achieves a maximum intracellular charge of _____ during Depolarization.
- 70 mV
 - 80mV
 - 30 mV
 - 60 mV
 - 80 mV
18. In Repolarization, the intracellular membrane becomes slightly more _____.
- positive
 - negative

19. Repolarization is caused by
- Na⁺ Channels being OPEN, and K⁺ Channels being CLOSED
 - Na⁺ Channels being CLOSED, and K⁺ Channels being OPEN
 - Na⁺ Channels being OPEN, and K⁺ Channels being OPEN
 - Na⁺ Channels being CLOSED, and K⁺ Channels being CLOSED

20. The membrane potential achieves a minimum intracellular charge of _____ during Repolarization.

- 70 mV
- 80mV
- 30 mV
- 60 mV
- 80 mV

Use the graph below to answer the following questions.



21. This represents
- Depolarization
 - Hyperpolarization
 - Resting Membrane Potential
 - Repolarization

23. This represents
- Depolarization
 - Hyperpolarization
 - Resting Membrane Potential
 - Repolarization

22. This represents
- Depolarization
 - Hyperpolarization
 - Resting Membrane Potential
 - Repolarization

24. This represents
- Depolarization
 - Hyperpolarization
 - Resting Membrane Potential
 - Repolarization

Please see the following page for answers.

ANSWER KEY

1. a

2. d

3. b

4. a

5. e

6. c

7. c

8. b

9. b

10. c

11. d

12. b

13. b

14. b

15. a

16. a

17. c

18. b

19. b

20. a

21. c

22. a

23. d

24. b

For use with TCC iTunes University Neural Signaling Lecture.
Developed by: Martha Kutter 2009 for the Learning Commons at
Tallahassee Community College.