

The Nervous System: Ion Channels

1. What structures in the cell membrane function as ion channels?
2. Ion channels are selective for specific ions. What three characteristics of the ions are important for this selectivity?
 - a.
 - b.
 - c.
3. Channels can be classified as either gated or nongated channels. A sodium channel that is always open would be classified as a/an _____ channel.
4. Would sodium ions move into or out of the neuron through these channels?

5. Voltage-gated potassium channels open at what voltage? _____ mV
6. Acetylcholine (ACh) and GABA are neurotransmitters that open chemically-gated channels. What ions pass into the cell when these channels are activated?
 - a. ACh: _____ ions
 - b. GABA: _____ ions
7. Ion channels are regionally located and functionally unique. List all the areas on the neuron and the type of potential dependent on the following types of ion channels:

Channels	Areas on the neuron	Type of potential
Nongated		
Chemically-gated		
Voltage-gated		

8. From the quiz, place an "X" by the characteristics of voltage-gated sodium channels.

- _____ Always open
- _____ Found along the axon
- _____ Important for action potential
- _____ Opened and closed by gates
- _____ Found on the dendrites and cell bodies
- _____ Important for resting membrane potential

9. Name two channels (gated or nongated) through which chloride ions could pass into the cell through.

- a.
- b.

10. a. The Japanese puffer fish contains a deadly toxin (tetrodotoxin). What type of channels does this toxin block? _____

b. What potential would this toxin block? _____

c. What specifically would cause death? _____