
Neuron Function

How does a signal travel across and between neurons?

Why?

Just as the coaxial cables that run down your street or through your house carry television and Internet signals, the job of a neuron is to move an electrical signal from one place to another in order to send sensory messages throughout the body. In a previous activity you saw how a membrane potential is formed both at rest and during an inflow of ions. In this activity you will explore how changes in membrane potentials can propagate a signal down the axon of a neuron.

1. Which of the gated embedded proteins in Model 1 allow sodium ions (Na^+) through the membrane?

Gates A, B, D and F allow sodium ions through the membrane

2. Which of the gated embedded proteins in Model 1 allow potassium ions (K^+) through the membrane?

Gates C, E and G allow potassium ions through the membrane

3. The neuron illustrated in Model 1 has received a signal from either a sensory cell (taste bud, skin cell, retinal cell, etc.) or from another neuron. What evidence do you find in diagram 1 of the model that indicates a signal has been received?

A signal ligand has bound to the ligand gated embedded protein and the gate has opened

4. In diagram 2 of Model 1, gated embedded protein B has opened. Was this opening triggered by the arrival of a signal ligand? If no, propose an alternate stimulus that might have triggered the gate to open.

No, diagram 2 does not show a ligand bound to embedded protein B. The gate may have opened because of the change in membrane potential from the flood of ions nearby.

5. Consider Model 1.

- a. When a signal moves down the axon of the neuron, which direction do sodium ions move through the voltage-gated embedded proteins?

Sodium ions move into the cell when the sodium gates are opened

- b. What does the movement of sodium ions across the membrane do to the membrane potential near the open embedded protein?

The membrane potential increases (gets more positive) as the sodium ions move into the cell

6. Consider Model 1.

- a. When a signal moves through the axon of the neuron, which direction do

Neuron Function Pogil Answers

Don L. Jewett, Martin D. Rayner



Neuron Function Pogil Answers:

Neuron Function Bruce C. Spalding, John R. Thornborough, 1994-01-01 **Science Citation Index**, 1992 Vols for 1964 have guides and journal lists **Basic Concepts of Neuronal Function** Don L. Jewett, Martin D. Rayner, 1984 *pH and Brain Function* Kai Kaila, Bruce R. Ransom, 1998-09-15 *pH and Brain Function* offers thorough coverage of this increasingly important area of research beginning with the fundamental concepts which include methodological and theoretical issues such as the measurement of pH and the concept of pH in neurobiology It explores aspects of regulation and modulation of intracellular pH in brain cells surveys the changes in pH that occur with neural activity and how these changes affect neural activity and discusses the role of pH in the pathophysiology of neurological diseases *pH and Brain Function* is an important resource for researchers in all areas of neuroscience as well as cell biology and physiology Book Jacket **Neuron's Function Revealed**, 2009 There s a new way to explore biologys secrets With a flash of light scientists from the U S Department of Energys Lawrence Berkeley National Laboratory and the University of California Berkeley zeroed in on the type of neural cell that controls swimming in larval zebrafish Using innovative light activated proteins and gene expression techniques the scientists zapped several zebrafish with a pulse of light and initiated a swimming action in a subset of fish that was traced back to the type of neuron that drives the side to side motion of their tail fins The technique behind this needle in haystack search for the neural roots of a specific behavior could become a powerful way to learn how any biological system works <http://newscenter.lbl.gov/press-releases/2009/09/16/light-activated-protein/> **Trophic Function of the Neuron**, **Trophic Function of the Neuron** Daniel B. Drachman, 1974

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