

BIO 25 PAL Worksheet
Week 9 (#1): Nervous System Review 1

Remember

1. The generation of nerve signals is ultimately dependent upon the concentration differences of ions. Starting with a cell that has equal amounts of sodium, potassium, and chloride both inside and outside the cell (plus protein anions), how can an “excitable” cell develop? Draw your answer.

Understand

2. Define permeability with respect to ions and the cell membrane.
3. As permeability changes in each situation below, what happens? Draw it on your cell and on a graph of the membrane potential, and use the word “hyperpolarization” or “depolarization” to describe the change.
 - A. sodium permeability increases
 - B. potassium permeability increases
 - C. sodium permeability decreases
 - D. potassium permeability decreases
4. Draw the complete action potential and label all of its phases, indicating which ions are moving when.

Apply

5. Anesthetics like novocaine or lidocaine block voltage-gated sodium channels. If you had a deep cut that needed stitching at urgent care, you’ll likely receive an injection of lidocaine before the stitching begins. How will this help? Similarly, how might novocaine (often used by dentists) be useful?