

Establishing the Resting Membrane Potential in a Neuron Answer Key

A The carrier protein has a shape that allows it to take up three sodium ions (Na^+).

B ATP is split, and a phosphate group is transferred to the carrier protein.

C A change in shape of the carrier protein causes the release of three sodium ions (Na^+) outside the cell. The altered shape permits the uptake of two potassium ions (K^+).

D The phosphate group is released from the carrier protein.

E A change in shape of the carrier protein causes the protein to release the potassium ions (K^+) in the cell. The carrier protein is once again able to take up three sodium ions (Na^+).

The sodium-potassium exchange pump actively transports three sodium ions (Na^+) outside of the cell for every two potassium ions (K^+) moved inside the cells. Small amounts of Na^+ and K^+ also diffuse (“leak”) slowly across the cell membrane, following their concentration gradient.