

Assignment #1: Introduction to Physiology and the Nervous System

When the threshold potential is high enough to cause the activation gate to open, which occurs at -55 mV, Na^+ ions pass through the channel, which as a result depolarizes the cell until membrane potential reaches 30 mV. At this point, known as the absolute refractory period, the inactive gate of the Na^+ ion channel closes and prevents any other action potentials from occurring. Also at this time, the voltage-gated potassium channels open and allow for an influx of potassium to enter the cell, causing repolarization and eventually hyperpolarization due to slow gate closing. This stage is also known as the relative refractory period. As a result, the membrane potential is dropped down to -90 mV. The repolarization leads into the relative refractory period, where the inactivation gate of the Na^+ ion channel reopens, but the activation gate remains closed, thus requiring a stronger stimulus to reach the threshold potential, although action potential is not guaranteed.