

# ALL SENSOR RECEPTORS ARE TRANSDUCERS

## General Mechanism of Action

stimulus



opening or closing of a gated channel or distortion of the membrane



flow of ions across the membrane



change in membrane polarization  
(RECEPTOR POTENTIAL)



if above threshold -

action potential in sensory neuron



information conducted to the brain for interpretation

**Note:** The sensations of sweet and bitter detected by taste buds, or stretching of a muscle which stimulates stretch receptors, are all conveyed by similar means—the movement of  $\text{Na}^+$  or  $\text{K}^+$  ions across the membrane, causing a change in membrane polarization, which, if above threshold, leads to a generation of action potentials in sensory neurons. **They are distinguished as different sensations because the various sensory neurons are connected to different regions in the brain.** It does not matter where the impulses originate or what stimulus initiates the impulses. It only matters what part of the brain is stimulated. **Specific sensations are the brain's interpretation of incoming stimuli.** What an animal senses, then, is shaped and constrained by the nature of its sensory receptors and the wiring of its nerve cells. If somehow you could cross the optic nerve with the acoustic nerve, you would then see thunder and hear lightning!