Cell Communication

Section 3

Sending Signals

Key Idea: Cells Communicate and coordinate activity by sending chemical signals that carry information to other cells.

A signal is a molecule, that is detected by the target cell.

Targets

- Target cells have specific proteins that recognize and respond to the signal.
- Neighboring cells can communicate through direct contact between their membranes.
  - Short-distance - a few cells away
  - Long-distance - carried by hormones and nerve cells

Environmental Signals

- Signals come from outside
  - For example, light, so the length of day determines when some plants flower.

Receiving Signals

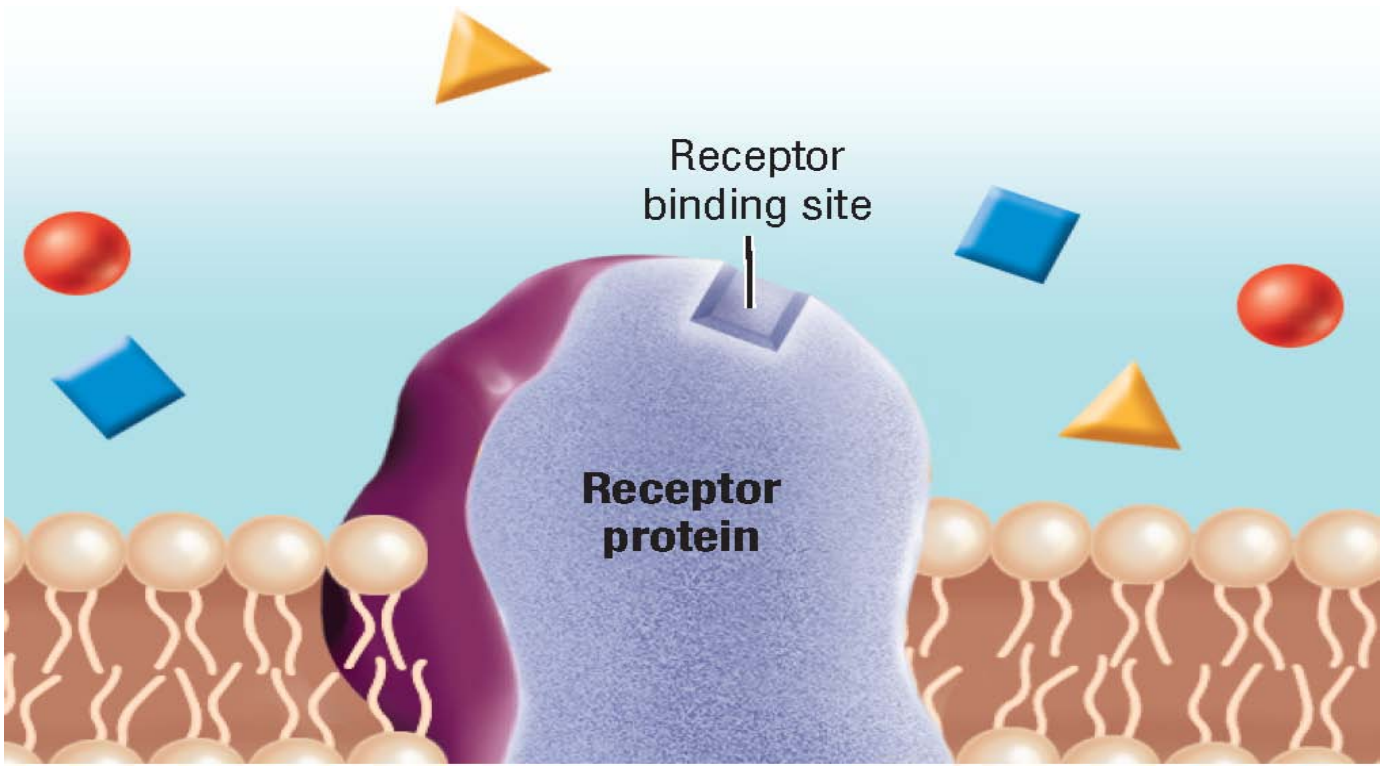
Key Idea: A receptor protein binds only to signals that match the specific shape of its binding site.

A receptor protein is a protein that binds specific signal molecules, which cause the cell to respond

Binding Specificity

- A receptor protein binds only to signals that match the specific shape of its binding site.
- Receptor proteins also bind to molecules in its environment.

Binding Site Receptor Proteins



Effect

- Once the receptor protein binds to the signal molecule, it changes its shape in the membrane.
- This change in shape relays information into the cytoplasm of the target cell.

Responding To Signals

Key Idea: The cell may respond to a signal by changing its membrane permeability, by activating enzymes, or by forming a second messenger.

A second messenger is a signal molecule that acts within the cell and causes changes in the cytoplasm and nucleus.

Responding to Signals

- **Permeability Change** - Transport proteins may open or close in response to a signal.
- **Enzyme Activation** - Enzymes trigger chemical reactions in the cell.