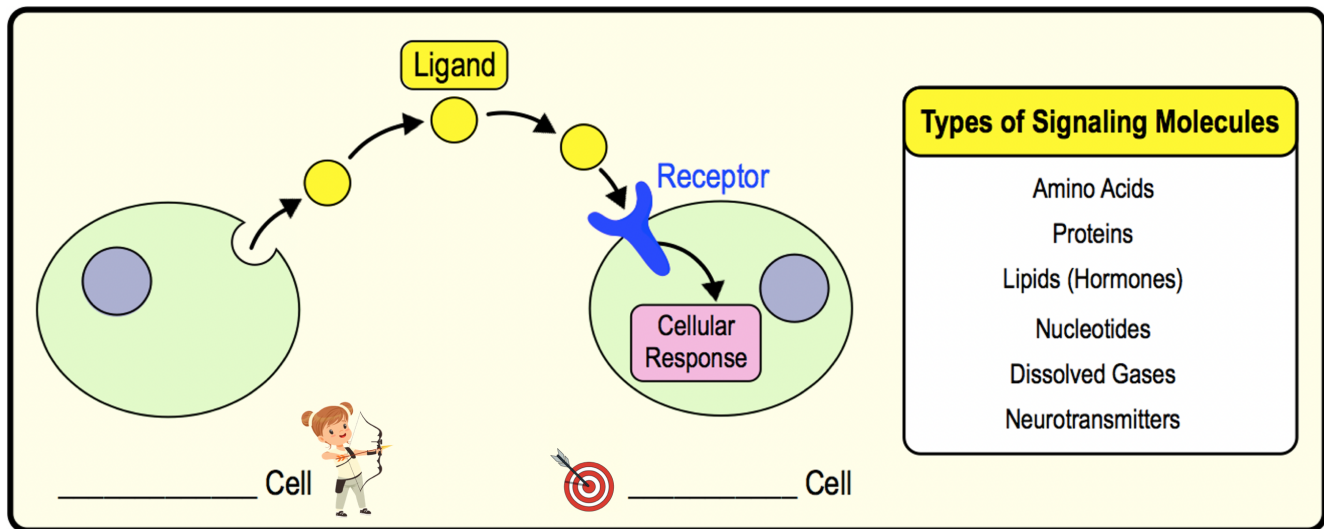


CONCEPT: INTRODUCTION TO CELL SIGNALING

- **Cell** _____: the ability for all cells to *produce, receive & respond* to external signals/conditions.
 - Allows for effective cellular *communication*.
- **Cell signaling** requires a *minimum* of _____ key components:
 - 1) _____: a small signaling molecule that binds & forms a complex with a *biomolecule/receptor*.
 - 2) _____: biomolecule (protein) that changes _____ (or *conformation*) upon ligand binding.
 - Conformational change leads to a series of events, ultimately ending with a *cellular* _____.



PRACTICE: The cells of multicellular organisms use a variety of molecules as signals which are

- Amino acids and proteins.
- Nucleotides and lipids.
- Dissolved gases like nitric oxide.
- Only a and b.
- a, b, and c.

PRACTICE: Which of the following is likely to be a response by a receptor protein to an approaching signal molecule?

- The receptor protein binds to the signal if it has a complementary shape.
- If the signal is able to bind to the receptor it induces a change in the receptor protein's shape.
- The change in the receptor protein's shape results in cellular action.
- All of the above are correct.

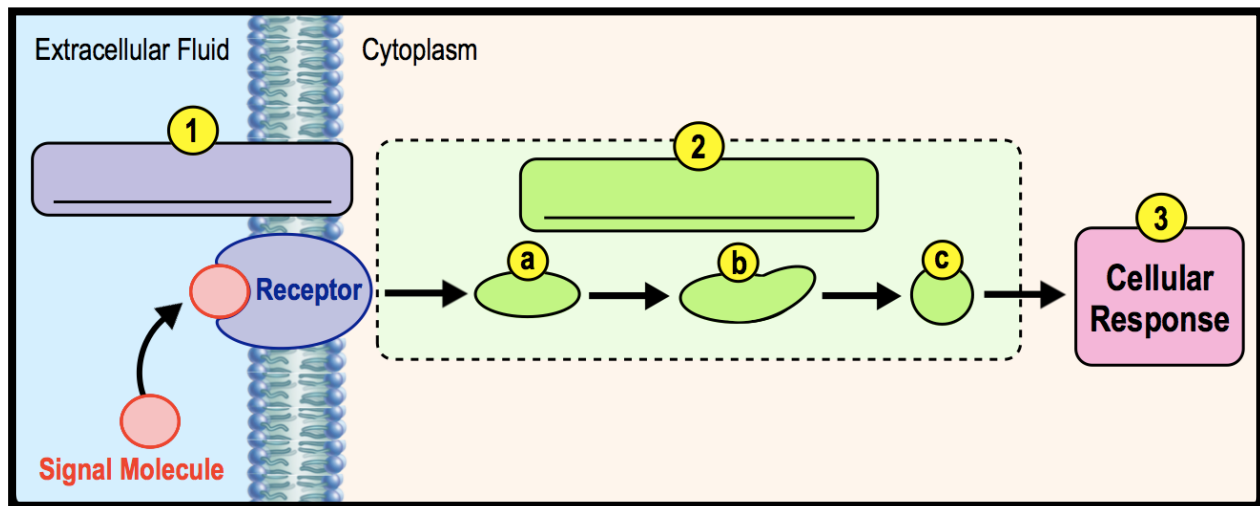
CONCEPT: INTRODUCTION TO CELL SIGNALING

3 Steps of Cell Signaling

● Cells *receive* external signals in a series of _____ steps:

- 1) _____: ligand binds to a *specific* receptor causing it to *change* its _____.
- 2) **Transduction**: pathway of interactions in the cell that _____ the *signal* to a *change* in the cell.
- 3) **Cellular** _____: end result causing a physical or chemical *change* in response to the ligand.

EXAMPLE: Steps of Cell Signaling.



PRACTICE: Signal transduction pathways:

- a) Are necessary for signals to cross the membrane.
- b) Include the intracellular events caused by a signal binding to a receptor.
- c) Include the extracellular events caused by a signal binding to a receptor.
- d) Carry a signaling molecule to the nucleus of a cell.

PRACTICE: What does it mean to say that a signal is transduced?

- a) The signal enters the cell directly and binds to a receptor inside.
- b) The physical form of the signal changes as it passes from the cell membrane to the intracellular target.
- c) The signal is amplified, such that even one signal molecule evokes a large response.
- d) The signal triggers a sequence of phosphorylation events inside the cell.