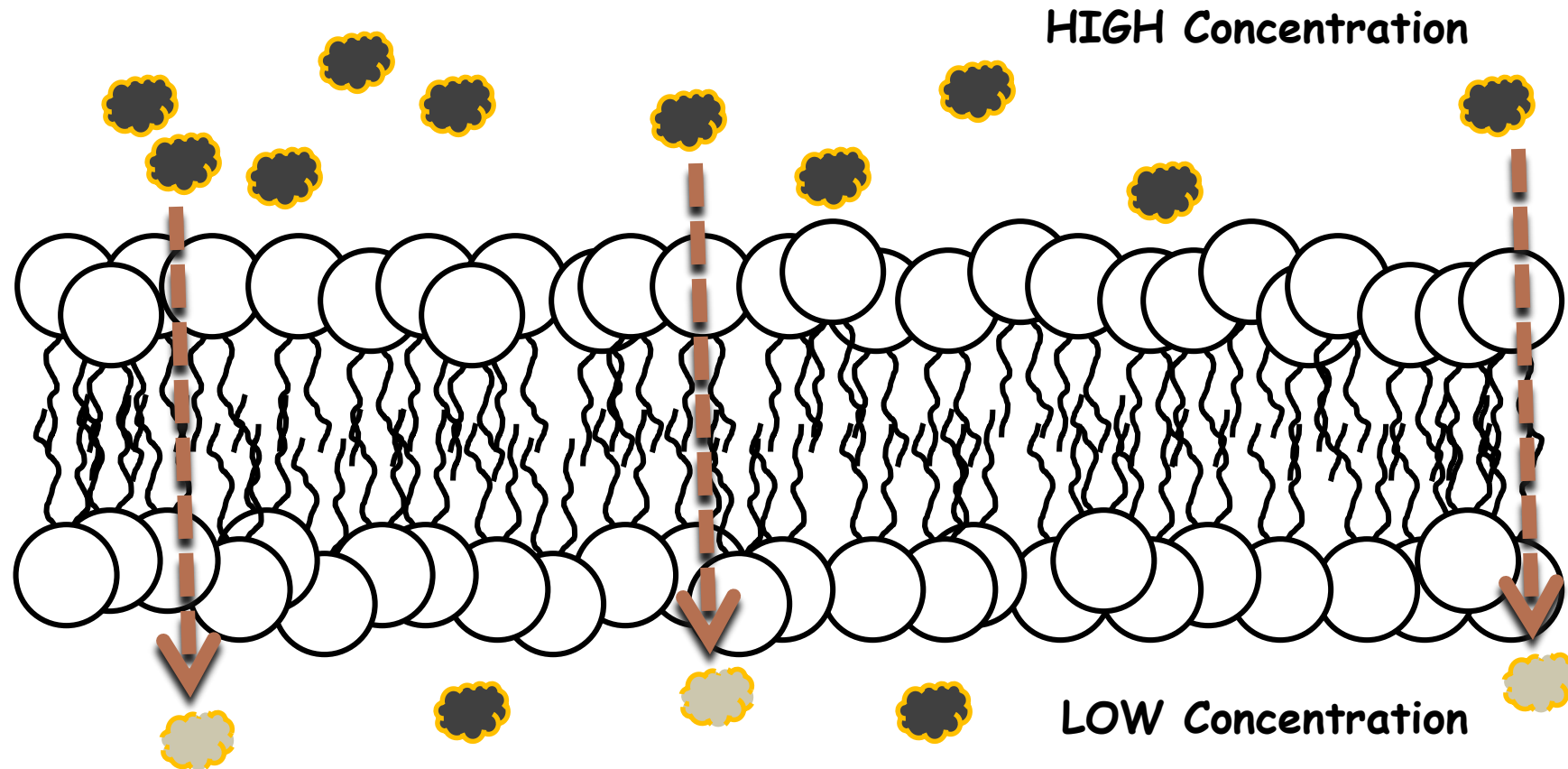


Cellular Transport Foldable

Cellular Transport

Picture for *Simple Diffusion*



Simple Diffusion

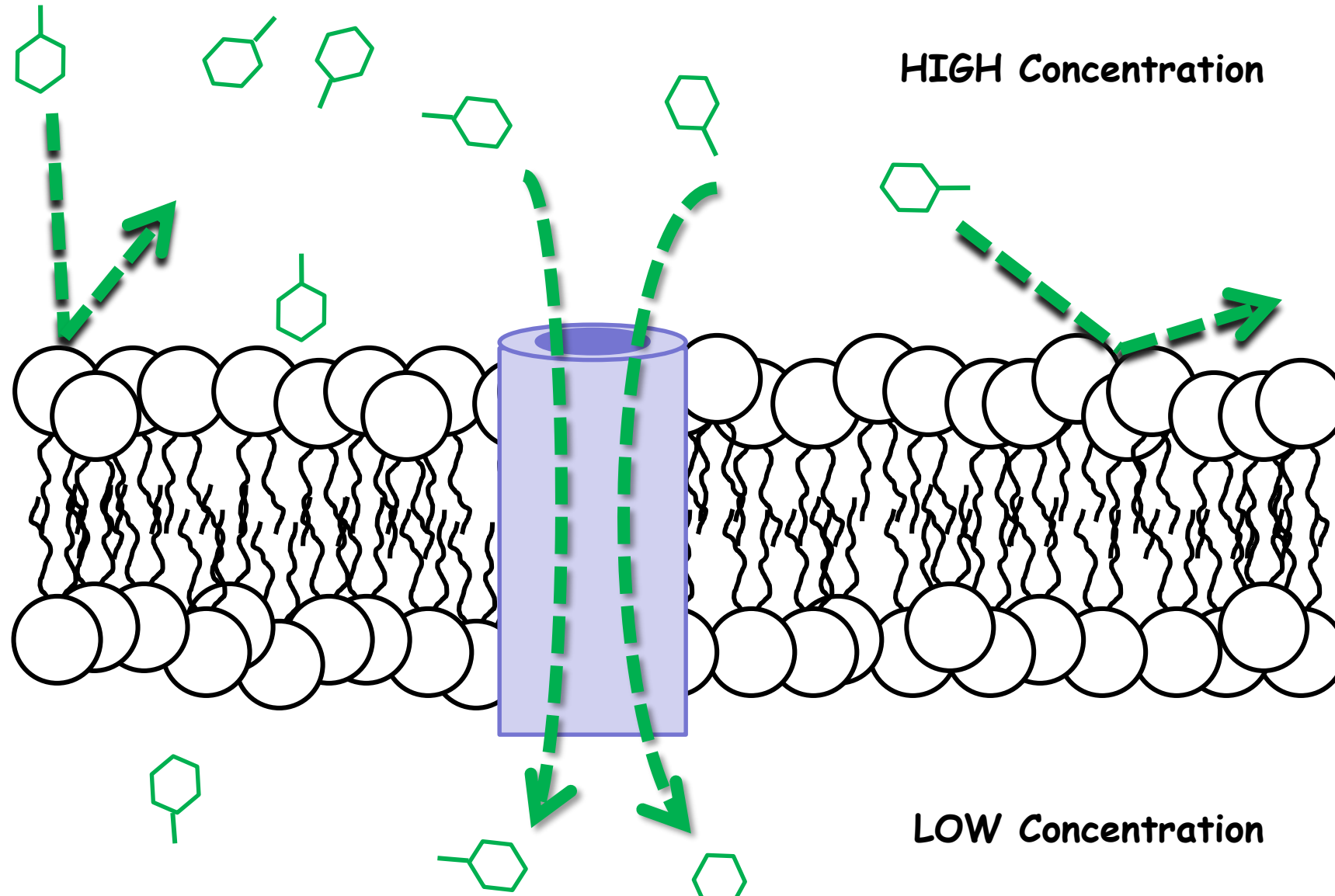
- **Diffusion** - **ALWAYS** moves solutes from High Concentration → Low Concentration
(*Down the concentration gradient*)
- Simple diffusion allows molecules to move through the phospholipid bilayer without needing help.
 - Molecules must be **Small**, **Nonpolar** and **Not have a charge**
- Diffusion **NEVER** needs energy (ATP)

Simple Diffusion

Examples:

- 1) perfume/cologne will diffuse through the entire room when someone sprays it.
- 2) if the room catches on fire, the students will diffuse from inside (High concentration) to outside (Low concentration) of students
- 3) a child going down a slide is like moving down the concentration gradient.

Picture for *Facilitated Diffusion*



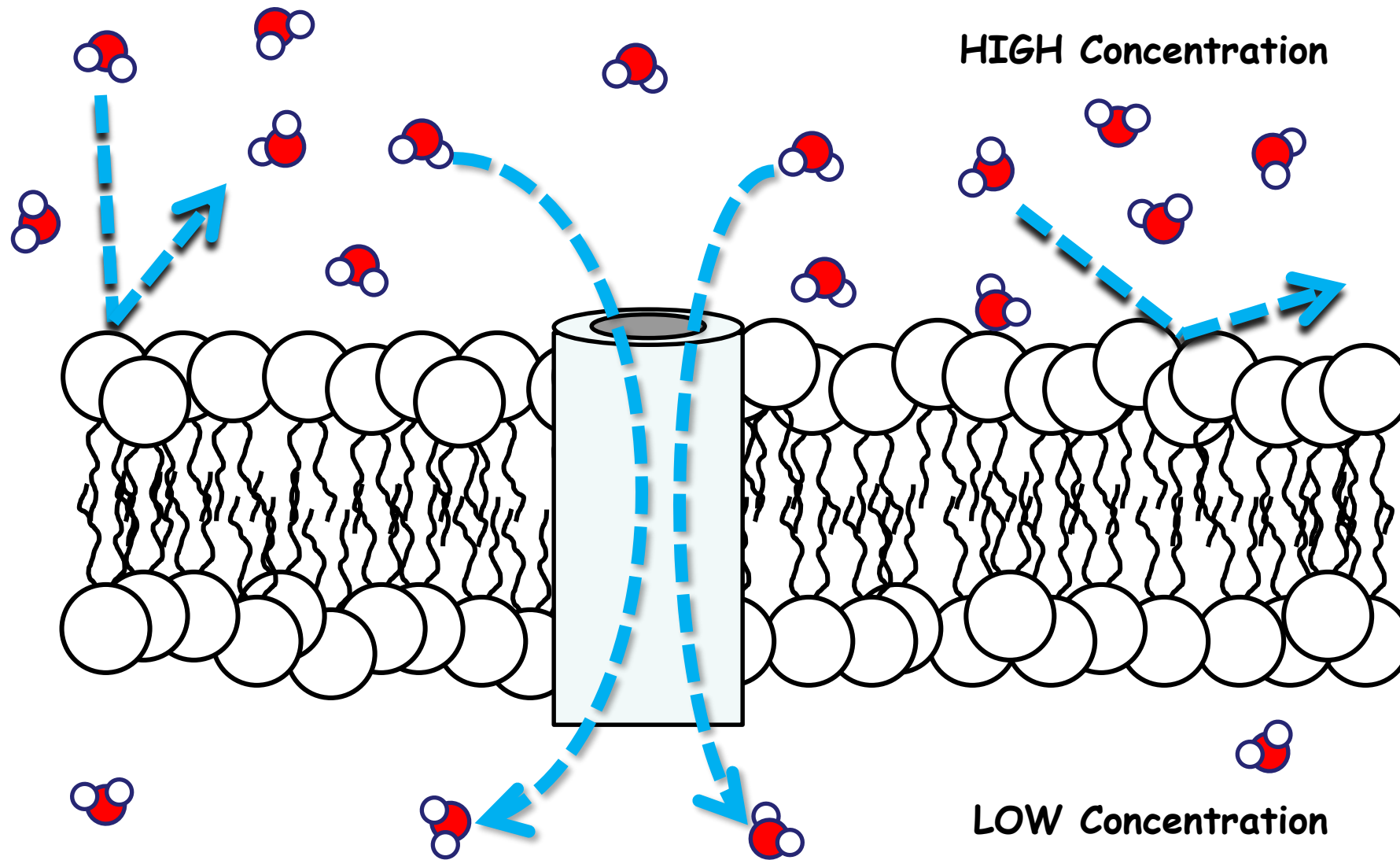
Facilitated Diffusion

- Facilitated Diffusion **ALWAYS** moves from High Concentration → Low Concentration (*Down the concentration gradient*)
- **Facilitated diffusion** - **REQUIRES** a helper transport protein to get solute molecules across the phospholipid bilayer.
- Facilitated Diffusion **NEVER** needs energy (ATP)


Facilitated Diffusion

- The **solute** molecules are either **Too BIG** or **Too HYDROPHILIC** to cross the lipid area of the phospholipid bilayer
- Transport proteins act as a tunnel that solutes travel through.

Picture for *Osmosis*



Osmosis

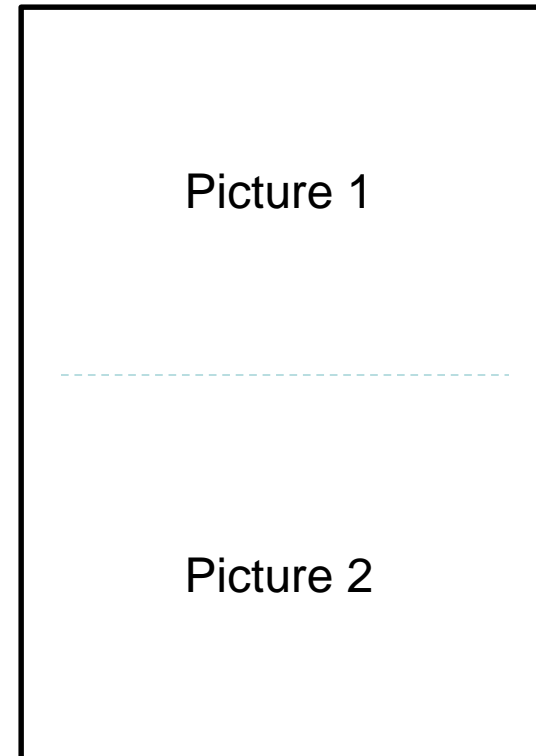
- Osmosis **ALWAYS** moves from High Concentration → Low Concentration (*Down the concentration gradient*)
- Osmosis **REQUIRES** a helper transport protein to get **WATER** molecules () across the phospholipid bilayer.
- Osmosis **NEVER** needs energy (ATP)

Osmosis

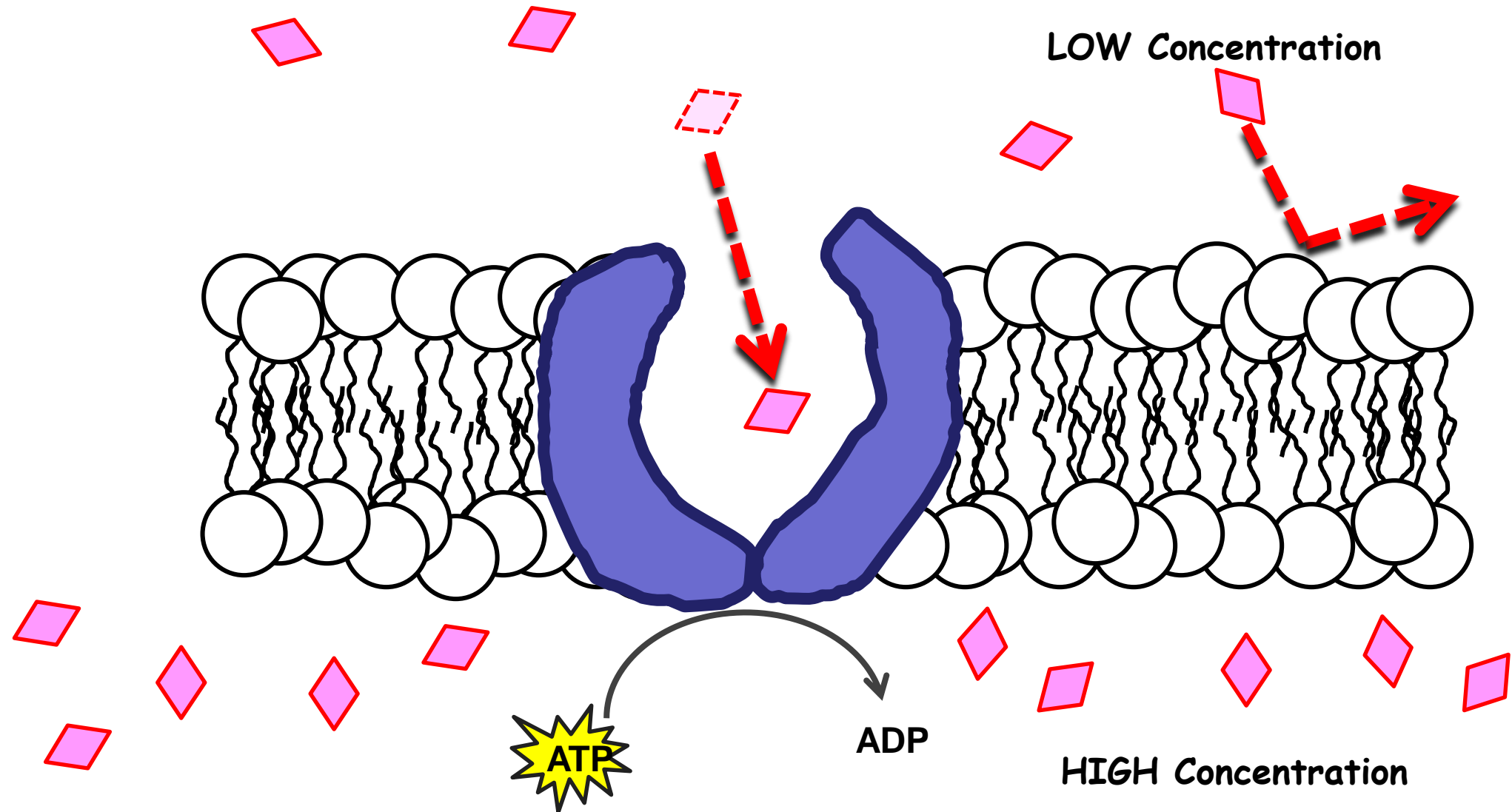
- **Osmosis** – Movement of water across a membrane
- Water molecules will never be able to easily cross the lipid area of the phospholipid bilayer, but ALL CELLS NEED WATER
- **Aquaporin** is the transport protein that acts as a tunnel that solutes travel through.

2 Pictures for *Active Transport*

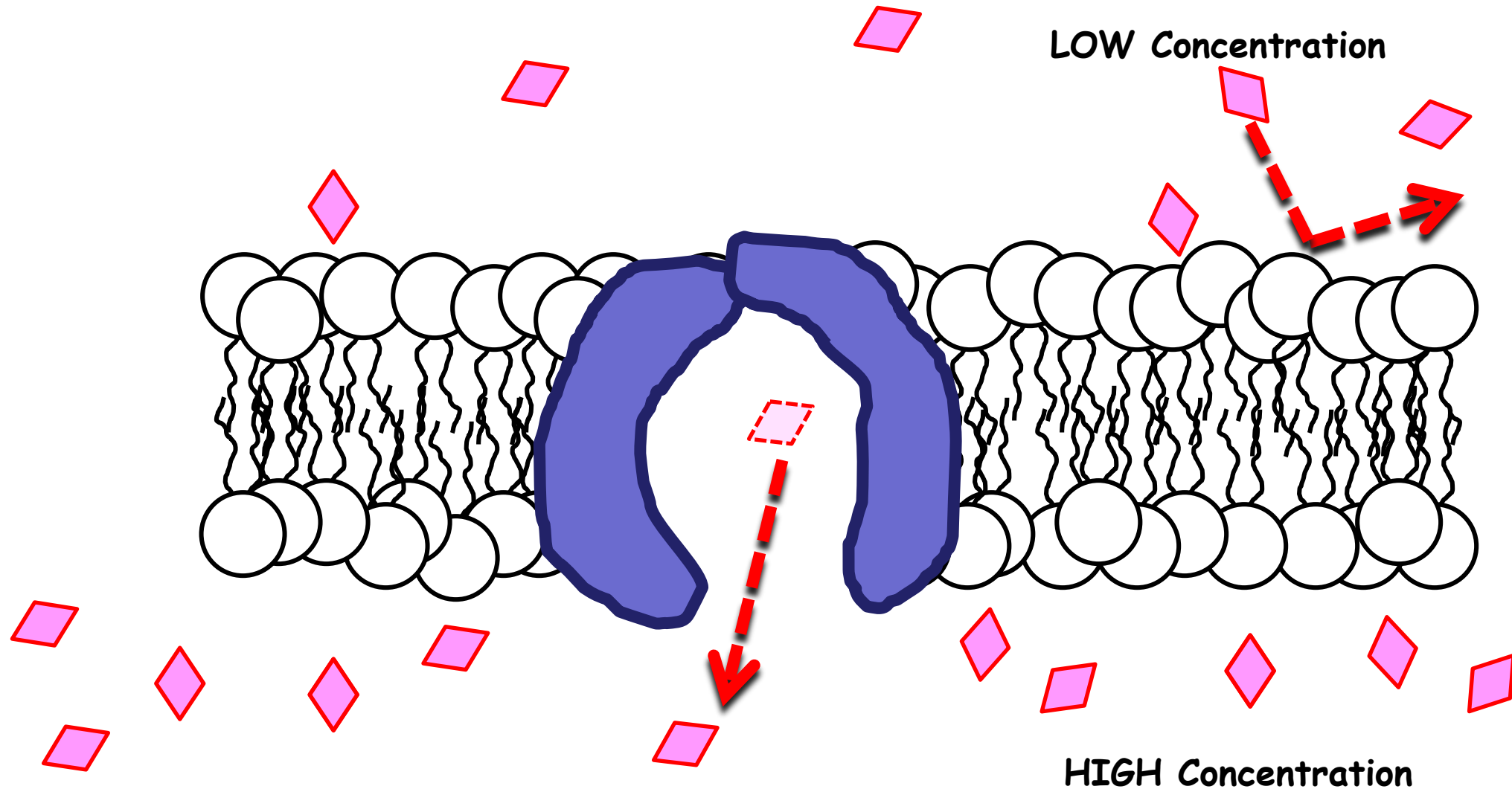
- NOTICE: There are two pictures for **Active Transport**. Put one picture above the other



Step 1 for *Active Transport*



Step 2 for *Active Transport*



Active Transport

- Active Transport **ALWAYS** moves from **LOW** Concentration → **HIGH** Concentration (**AGAINST** *the concentration gradient*)
- **Active Transport** - **ALWAYS REQUIRES ENERGY (ATP)** and a helper transport protein to get solute molecules across the phospholipid bilayer **AGAINST** the concentration gradient
- Active Transport **ALWAYS** needs energy (ATP)

Active Transport

- Ex: Think of a bouncer at a popular club.

When the cell (club) is full, and a solute (person) wants to try and get in, they have to **PAY** the bouncer to let them “sneak” by.

Money would be like the cell paying ATP energy to make the protein channel (bouncer) let the solute (person) in.

- Active Transport is the only kind of cell movement that **REQUIRES** energy to work.