

# Chapter 8: Cell Structure & Function

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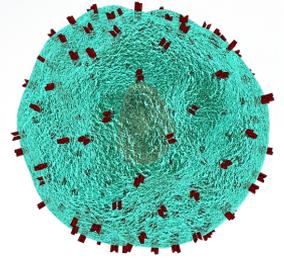
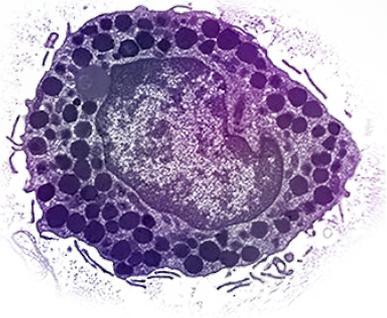
Ms. Rivera Spring 2020

# Cell Theory:

1. All living things are made up of cells.
2. Cells are the basic units of structure and function in living things.
3. New cells are produced from existing cells.



# What are cells?



All cells contain a cell membrane and DNA

# There are two different types of cells...

## Prokaryotic Cells

-Does not have a nucleus

-Single Cellular

-Relatively simple

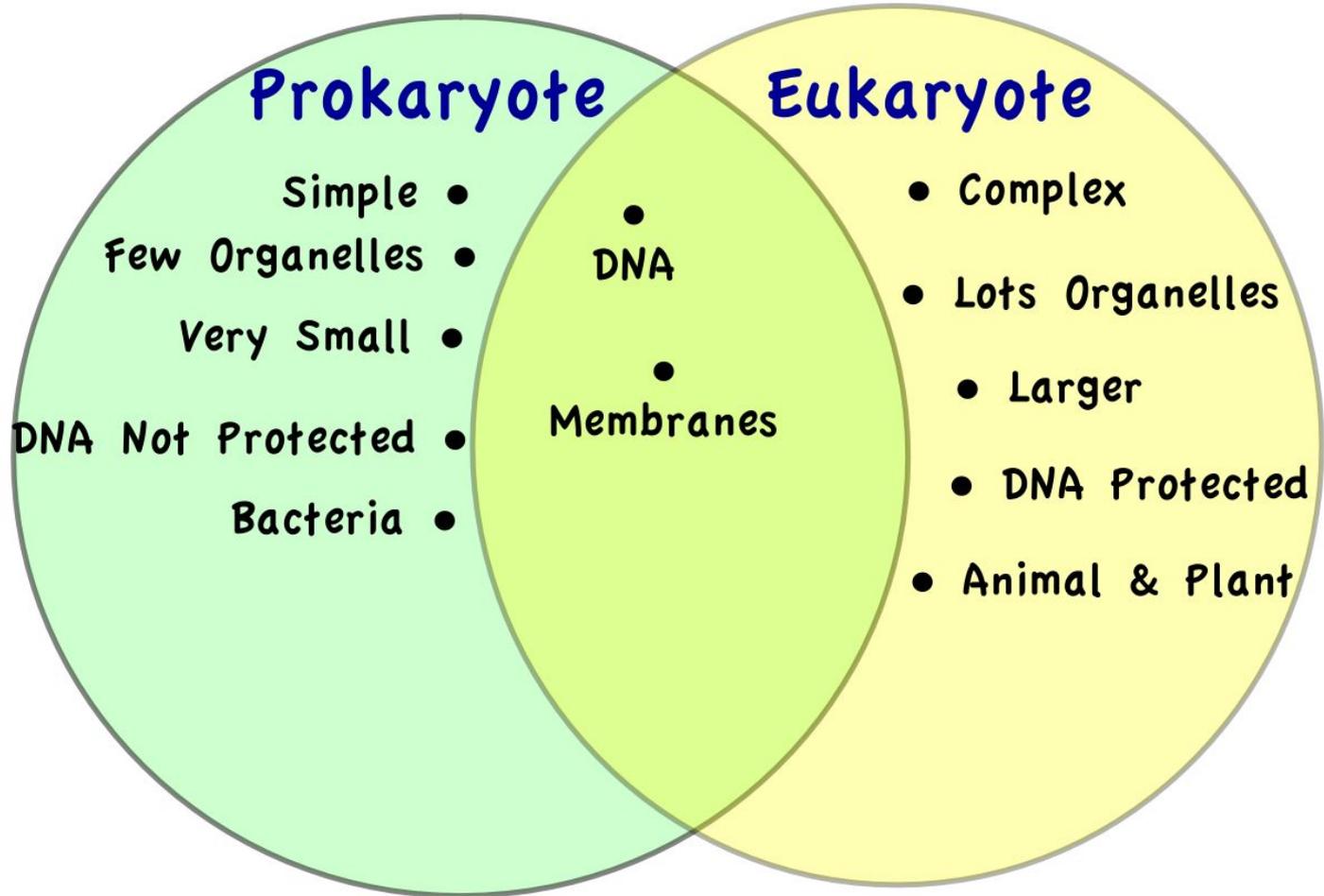
## Eukaryotic Cells

-Has a nucleus to hold DNA

-Single or multicellular

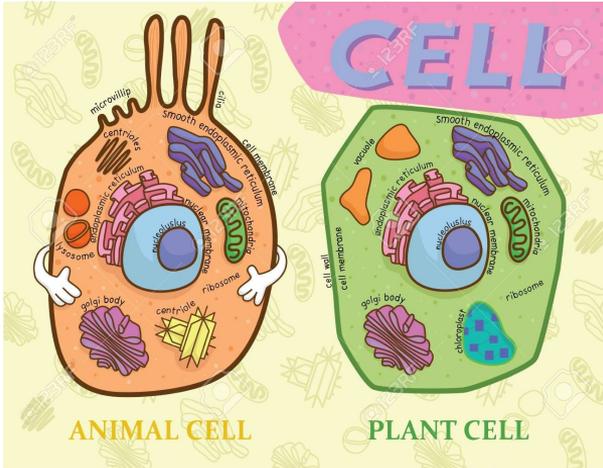
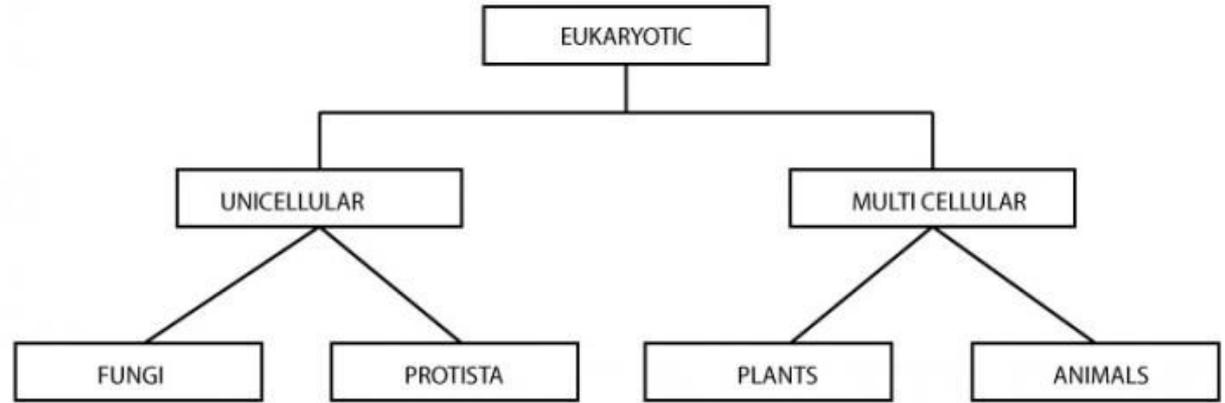
-More complex and have dozens of organelles

# Cell Types

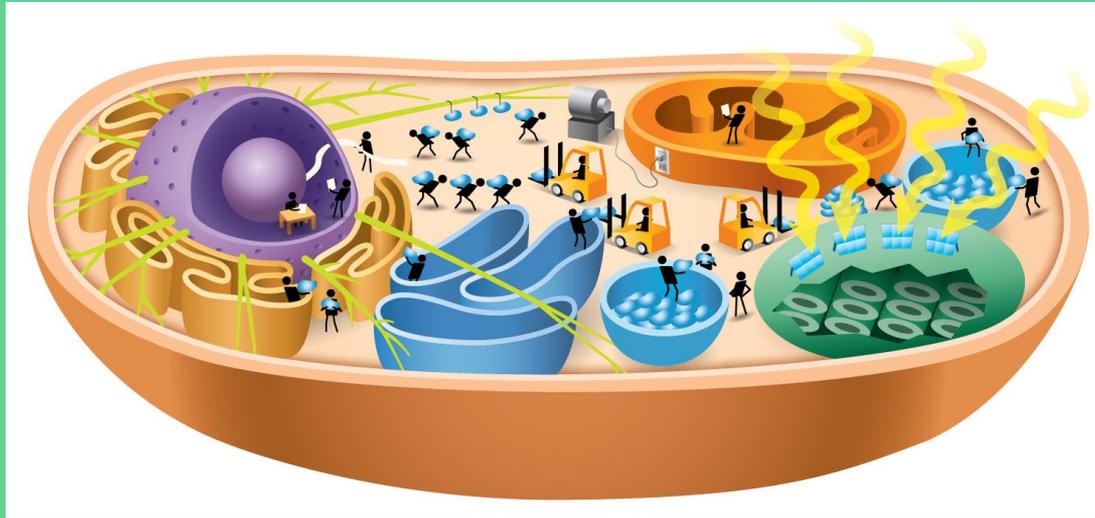


# There are many types of Eukaryotic Cells...

But Plants and Animals are the most familiar



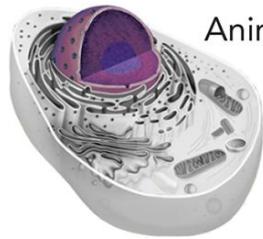
Eukaryotic cells have organelles with different functions.



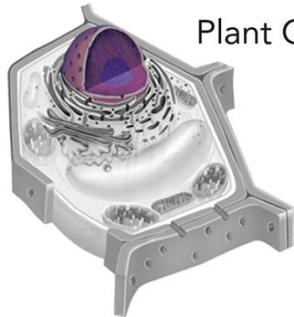
# 1. Nucleus

The “Control Center” of the cell

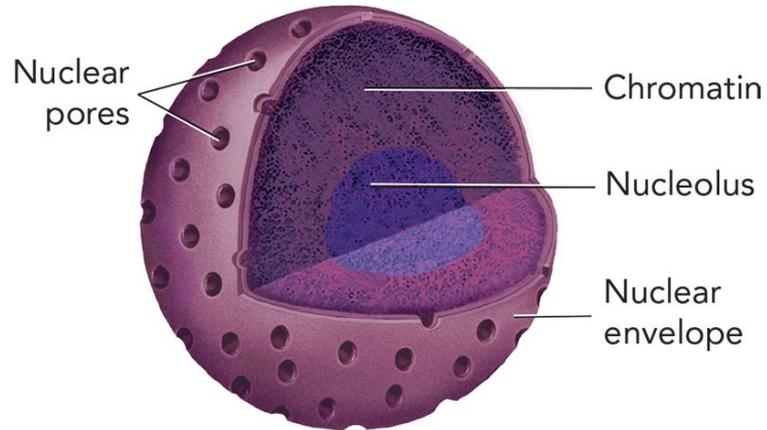
Contains the DNA



Animal Cell



Plant Cell



Nuclear pores

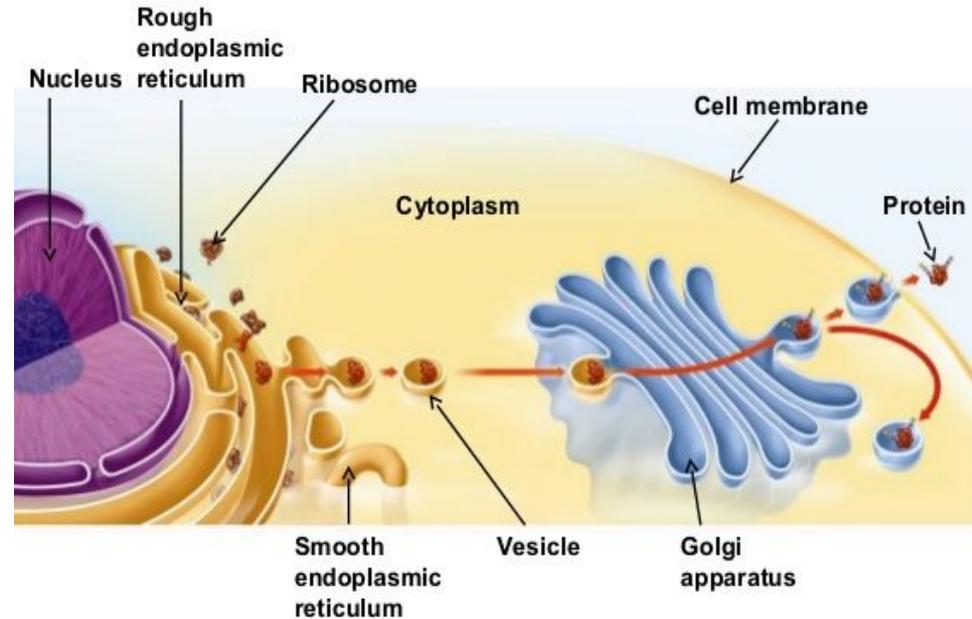
Chromatin

Nucleolus

Nuclear envelope

## 2. Organelles that build protein

- ❑ Ribosome  
-Make Protein
- ❑ Endoplasmic Reticulum  
-Makes lipids and proteins that will be sent out of the cell
- ❑ Golgi Apparatus  
-Modifies, sorts, and packages protein for transport



### 3. Organelles that Store, Clean up, and Support

- ❑ Vacuole

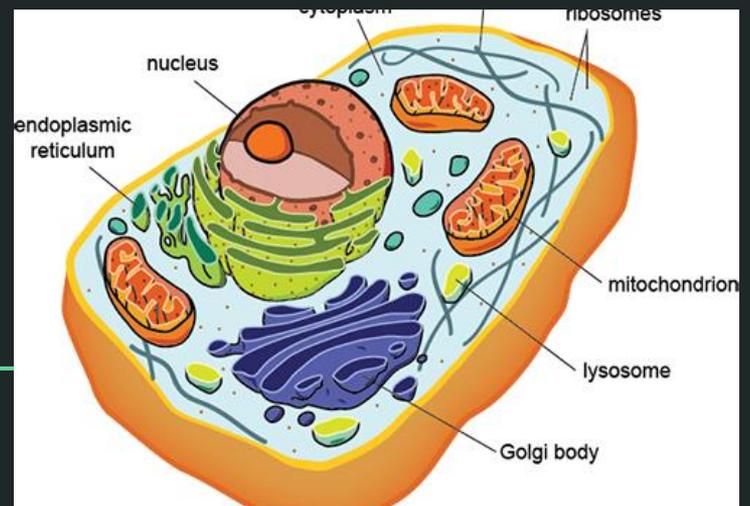
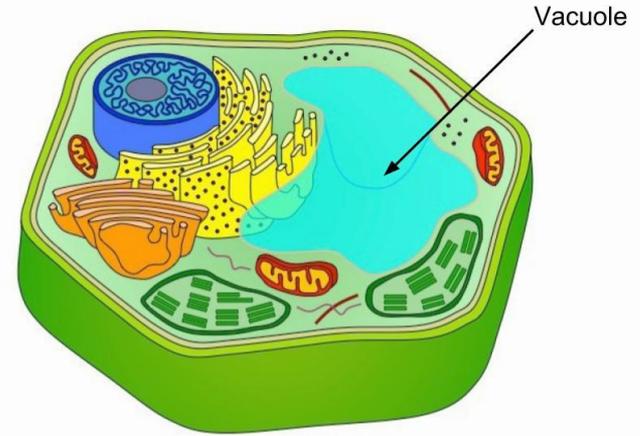
  - Stores water, nutrients, and waste. Much larger in plants.

- ❑ Lysosome

  - Removes waste with digestive enzymes

- ❑ Cytoskeleton

  - Supports and shapes the cell



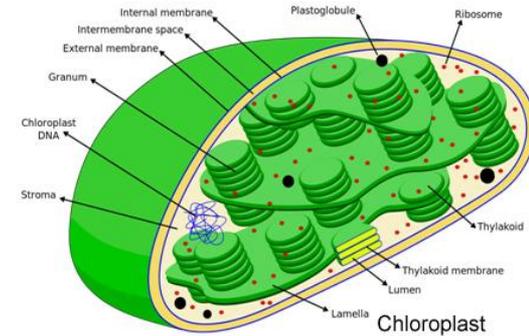
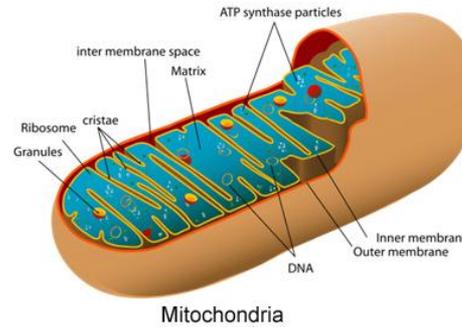
## 4. Organelles that capture/release energy

### Mitochondria

-Makes energy through cellular respiration

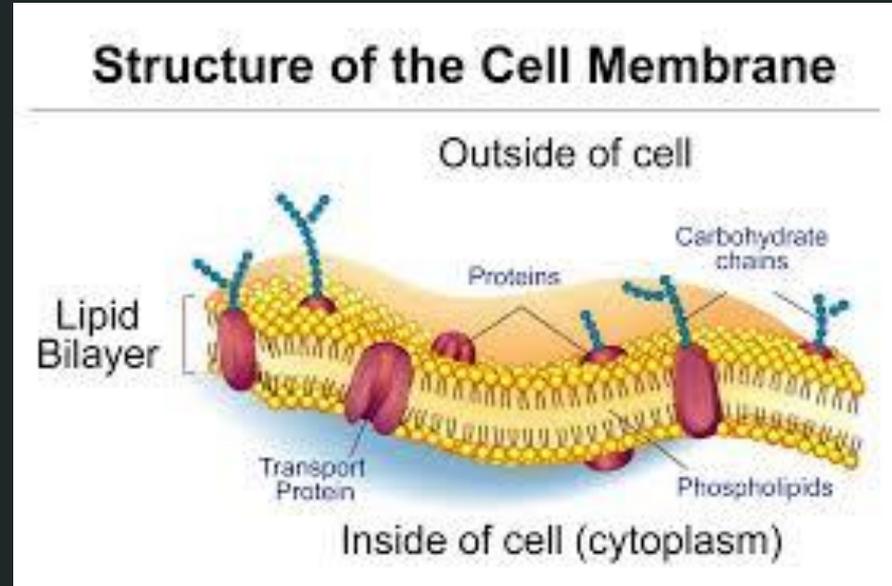
### Chloroplast

-Convert light into sugars through photosynthesis



## 5. Organelles that are Cellular Boundaries

- ❑ Cell Membrane
  - Found in all cells
  - Protects the cell
  - Allows selected molecules in and out of cell
- ❑ Cell Wall
  - Only found in Plants
  - Protects the cell and provides structure



Animal

Plant

-Small Vacuoles

-Lysosomes

-Nucleus

-Cell Membrane

-Ribosome

-Endoplasmic  
Reticulum

-Golgi Apparatus

-Cytoskeleton

-Mitochondria

-Chloroplast

-Cell Wall

-Large Vacuole

# Activity 1

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Solve each riddle to find the answer.

# Cell Transport

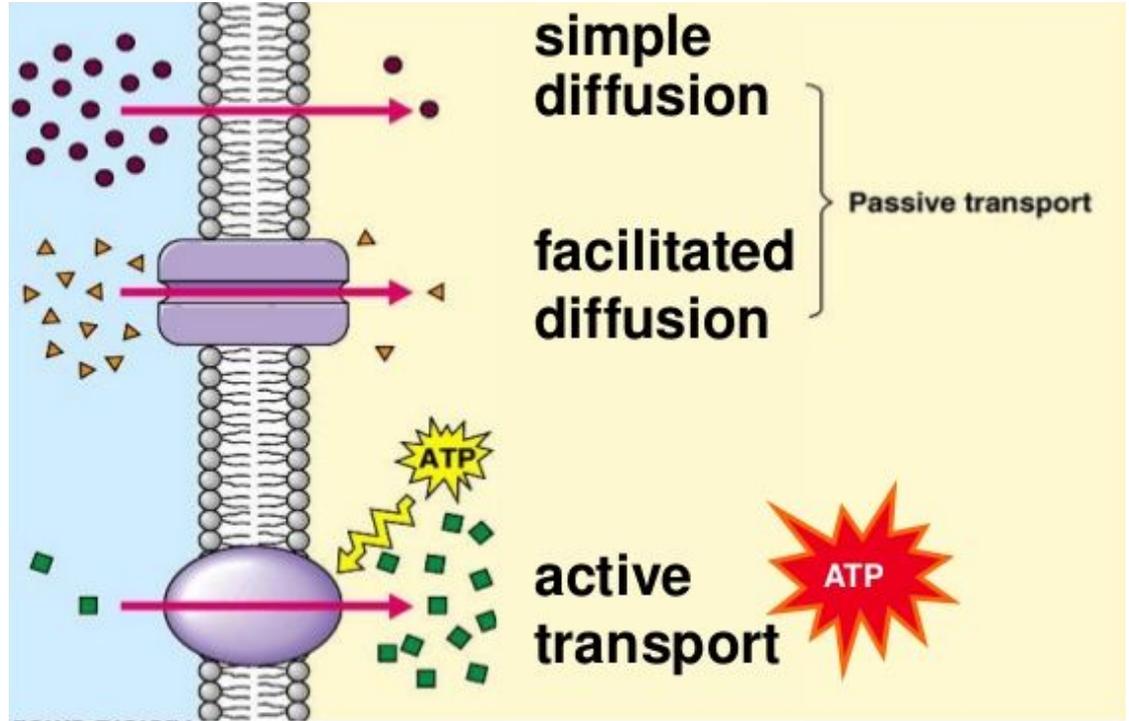
# Passive Transport vs. Active Transport

## Passive Transport

- From high to low concentrations
- diffusion & facilitated diffusion

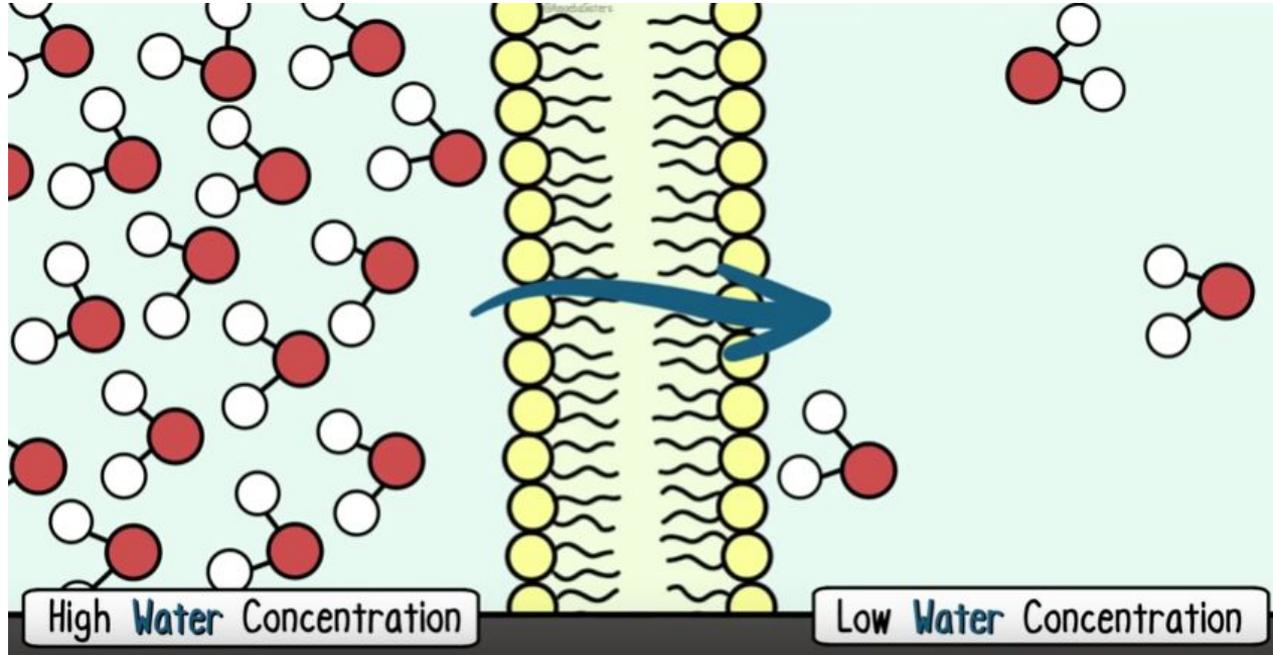
## Active Transport

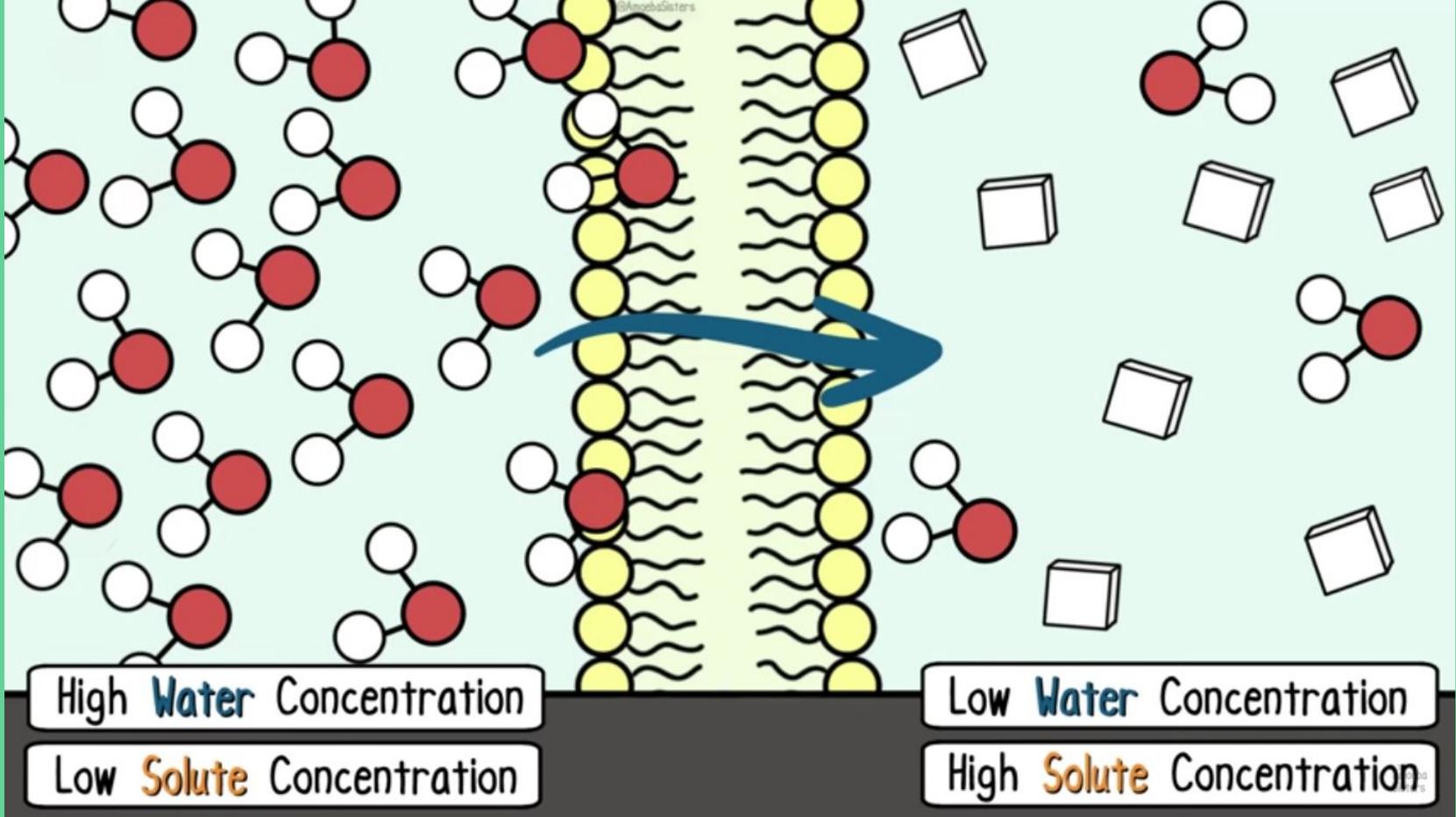
- From low to high concentrations
- Need Energy



# Osmosis

-Diffusion of solvent (eg. water) from a high concentration to a low concentration through a selectively permeable membrane.





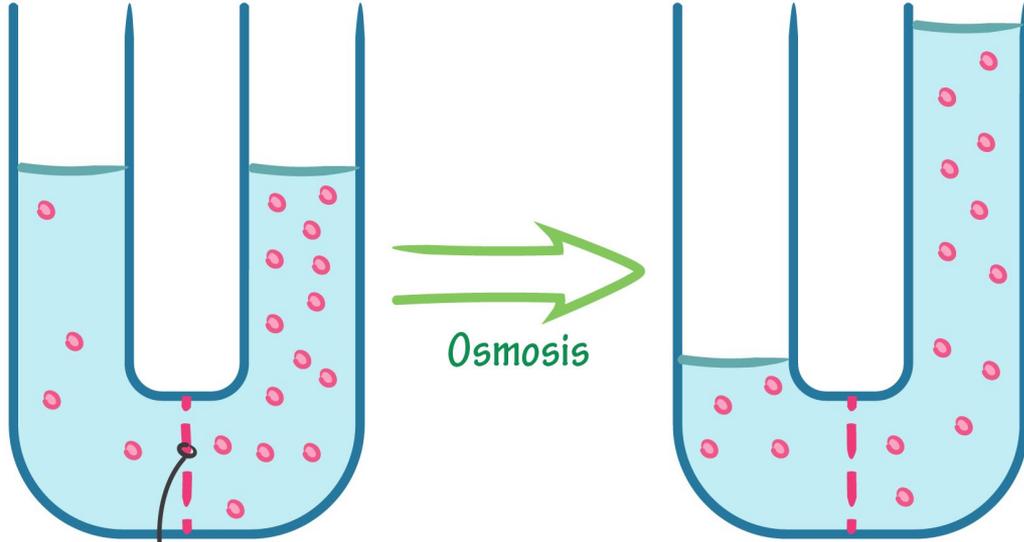
*~Water Follows Solutes~*

# OSMOSIS

Low solute concentration

High solute concentration

Equivalent solute concentrations



Semi-permeable membrane

# Types of Solutions

## Hypertonic

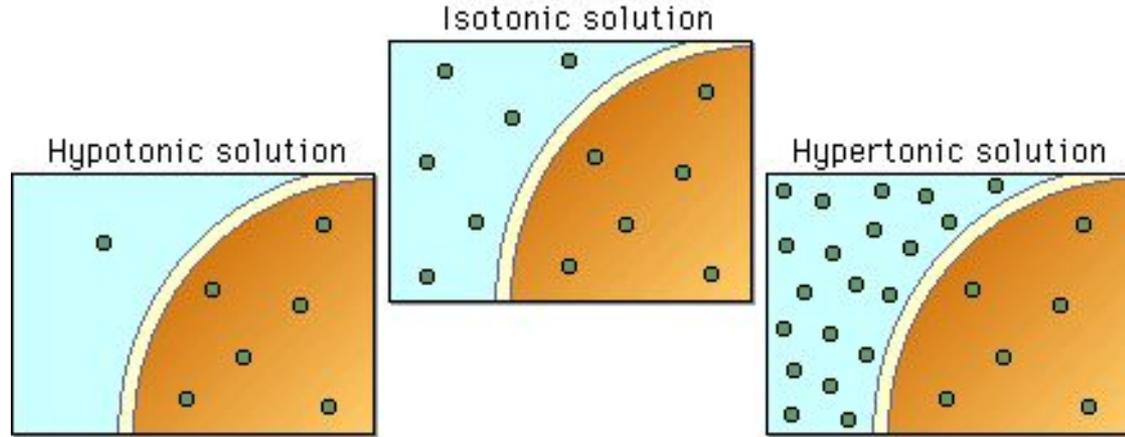
High concentration of Solute

## Isotonic

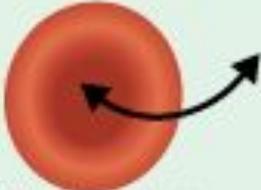
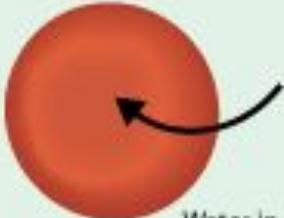
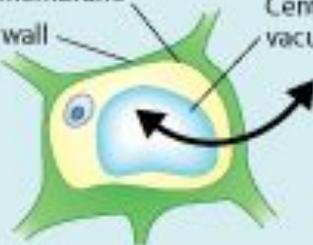
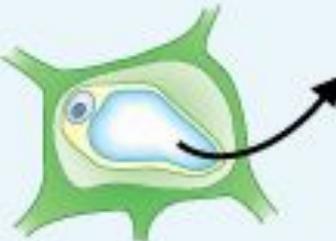
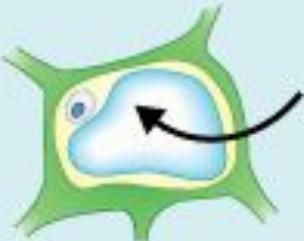
Same concentration of Solute

## Hypotonic

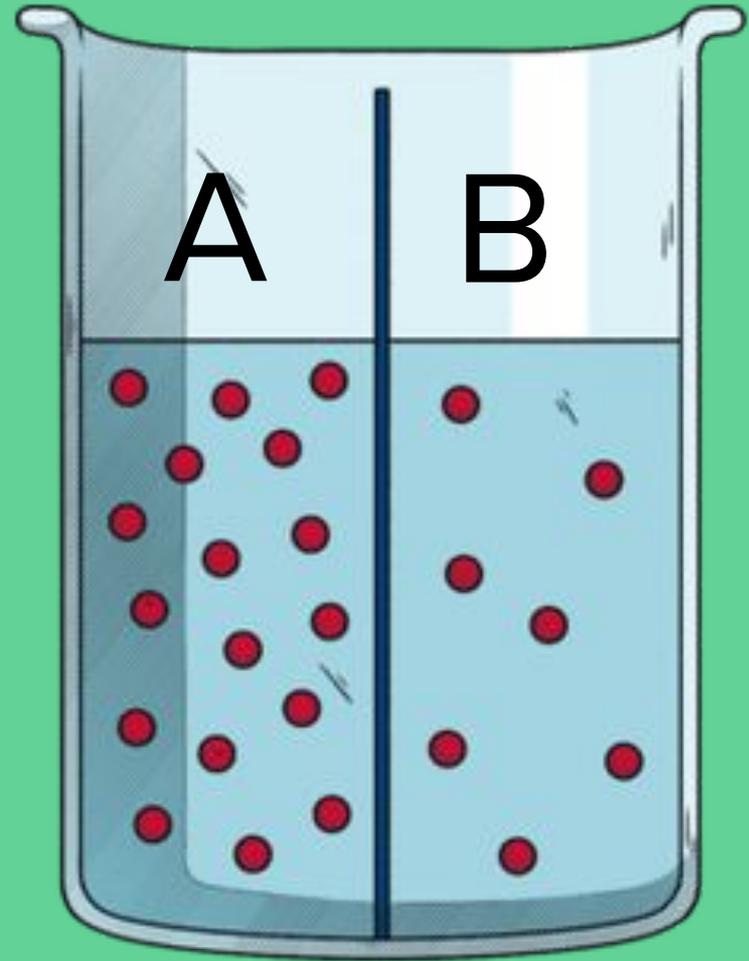
Low concentration of Solute

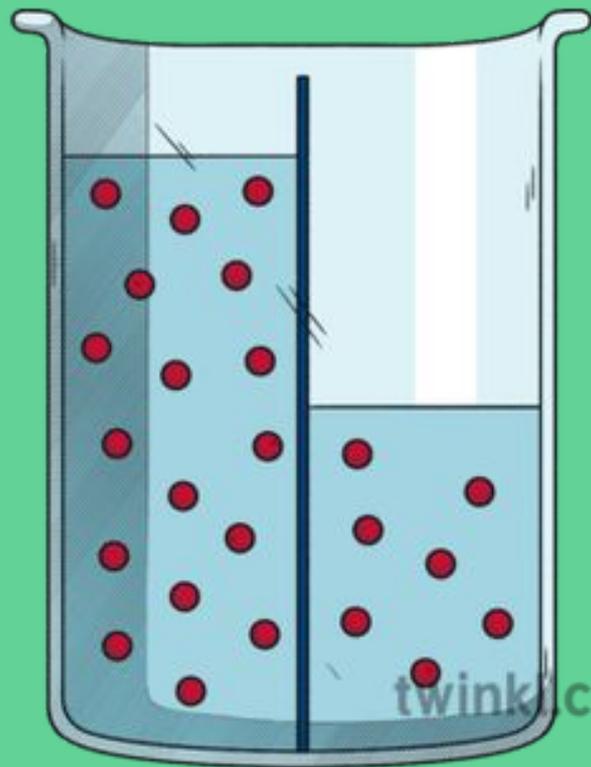
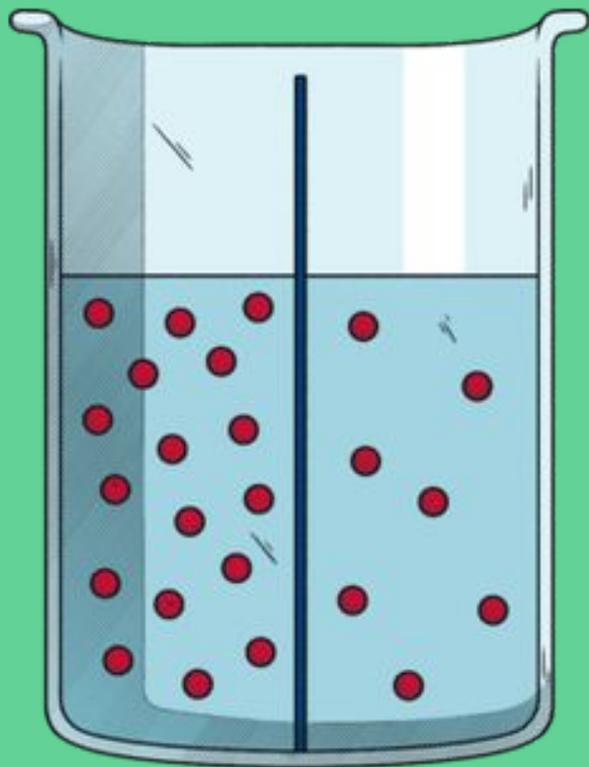


## The Effects of Osmosis on Cells

Solution	Isotonic: The concentration of solutes is the same inside and outside the cell. Water molecules move equally in both directions.	Hypertonic: The solution has a higher solute concentration than the cell. A net movement of water molecules out of the cell causes it to shrink.	Hypotonic: The solution has a lower solute concentration than the cell. A net movement of water molecules into the cell causes it to swell.
Animal Cell	 <p>Water in and out</p>	 <p>Water out</p>	 <p>Water in</p>
Plant Cell	<p>Cell membrane Cell wall Central vacuole</p>  <p>Water in and out</p>	 <p>Water out</p>	 <p>Water in</p>

Q1: The beaker has a membrane that separates the two solutions. How will the water move?





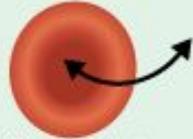
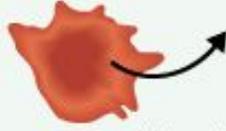
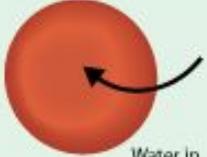
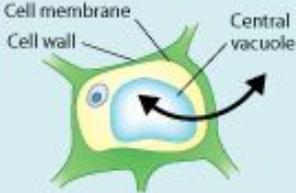
twinkl.com

Q2: When you go to the hospital, the nurses give you an IV filled with Sodium Chloride and water instead of just pure water.

Should you be concerned?



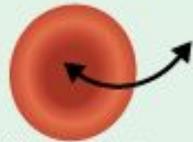
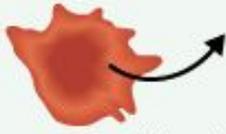
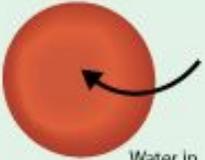
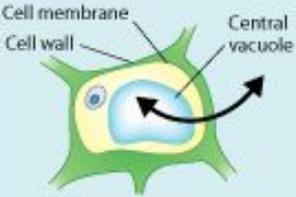
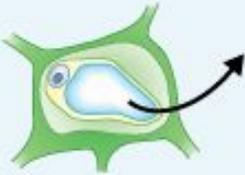
No!  
If it was pure  
water your cells  
could swell and  
burst.

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Q3: Your plane crashes and your stuck on a deserted island. You have no water. Should you drink the ocean water?



No!  
Drinking salt  
water would  
force water out  
of your cells and  
make you more  
dehydrated.

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## Bonus Question:

A dead man is found on a sandy beach. It appears he drowned.

Medical Examiners find an unusually low concentration of solutes in the man's cells. Should the police launch a murder investigation or conclude that the man drowned by accidental drowning?



## You should launch a murder investigation.

The low concentration of solutes in the man's cells indicate that water entered his cells through osmosis.

If the man drowned in the beach (salt water) water would have left his cells.

**CRIME SCENE DO NOT CROSS**  
**CRIME SCENE DO NOT CROSS**