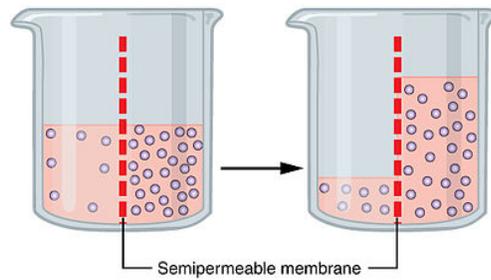


# L3. OSMOSIS

## WHAT'S OSMOSIS?



### Objectives:

1. Know about the osmosis phenomena.
2. Understand the process of osmosis in plasmatic membranes.

### MATERIALS:

- Egg
- Potato
- Salt
- Distilled water
- Acetic acid (or vinegar)
- Spatula
- 600 mL Beaker
- 3 Clock glass
- Pen
- Spoon
- Knife

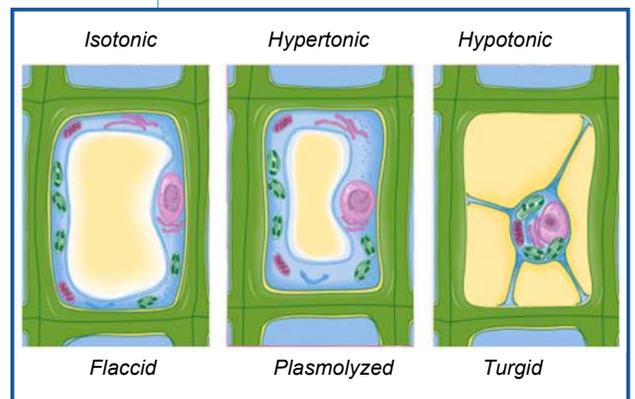
Osmosis is the spontaneous movement of solvent molecules through a semipermeable membrane into a region of higher solute concentration (hypertonic), in the direction that tends to equalize the solute concentrations on the two sides.

Osmosis is a vital process in biological systems, as biological membranes are semipermeable. Water molecules travel through the plasma membrane in order to equilibrate the intra and extra cellular concentrations.

When a cell is submerged in water, the water molecules pass through the cell membrane from an area of low solute concentration to high solute concentration.

When the extracellular concentration is hypertonic, water moves out of the cell and the cell becomes flaccid: *PLASMOLYSIS*.

When the extracellular concentration is hypotonic, water moves inside the cell and it becomes *TURGID*.



**PROCEDURE:**

**Egg:** this experiment will be divided in two days.

Under the hard outer shell of a chicken egg is a semipermeable membrane that allows air and moisture to pass through. Because water molecules can move into and out of the egg but larger molecules cannot, the semipermeable egg membrane allows for an exploration of concepts of diffusion and osmosis.

**1<sup>st</sup> Day:**

**Before the egg osmosis experiment could begin**, the egg's hard outer shell must be removed. Let's start with this:

1. Take a 600mL beaker and put inside the egg.
2. Cover the egg with vinegar and make note of what's happening. Remember our last experiment!

**Once the egg's shell is removed** and the egg is rinsed dry and clean, **measure and weigh** the egg. Record the dimensions of each egg in a table.

3. Clean the beaker and put the egg inside again.
4. Cover it with distilled water. Make note of the volume of solution inside the beaker.

**2<sup>nd</sup> Day:**

5. Left the egg one day in the distilled water. After about a day, carefully remove the egg using a spoon. Rinse the egg with water and let it dry.
6. Measure again the dimensions and record its weight.
7. Make note of the solution volume in the beaker and notice if there has been any difference.
8. Observe the results and write your conclusions in your lab worksheet.

**Potato:**

1. Lay out three watch glass.
2. Slice the potato in three parts lengthwise. Each slice must be of 1,5cm thick.
3. Place each slice onto a watch glass and make a hole in the middle of each slice. NOTE: the hole does not have to cross the slice!
4. In the first slice hole, don't put anything. The second fill it with salt and the third with distilled water.
5. Left this preparation 30 minutes and make note of what is happening.

## QUESTIONS:

Egg experiment:

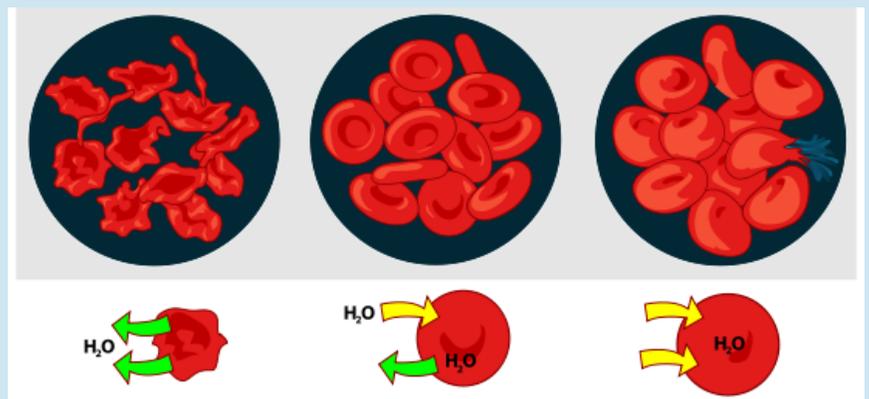
1. What is happening when the shells are soaking of acetic acid?
2. Write the results of de dimensions and weigh of the egg before and after immersing it in distilled water. Write and draw a simple diagram of the water direction.

Potato experiment:

3. Explain the results of this experiment.
4. Why have we left the first slice without any treatment (salt or distilled water)?
5. Which are the dependent and independent variables?

### General questions:

6. How can you explain (through osmosis) the ability of plant roots to draw water from the soil?
7. What will it happen if a saltwater fish is placed in a freshwater (low concentration of salts) aquarium?
8. Look the image you have below and explain what is happening to the erythrocytes in each situation:



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