

# PLASMOLYSIS

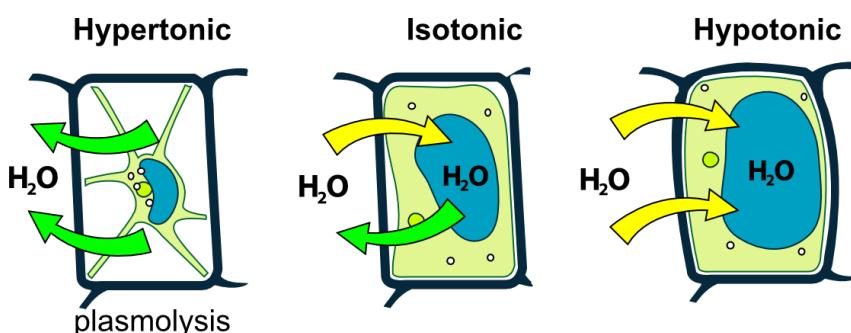
## INTRODUCTION

Every cell has a cell membrane that isolates the cell from its environment. The cell membrane takes care of transporting substances in and out of the cell. It is *semi-permeable*, which means that only a fraction of substances can pass through it: 1) Small molecules (such as gas molecules) can pass the membrane by **diffusion**. 2) Fat-soluble molecules can also diffuse through the membrane. In contrast, water-soluble molecules need assistance to go through the membrane.

**Osmosis** is a phenomenon where water passes through the cell membrane. The membrane itself is not permeable to water, but there are proteins that help the water to pass the membrane.

Water molecules leave the cell if the environment is **hypertonic** (more saline than the interior of the cell). If the exterior of the cell is **hypotonic** (less saline than the cell) water molecules are transported in the cell.

A plant cell is also surrounded by a rigid cell wall. In a concentrated (saline) solution water molecules leave the cell. This causes the cell membrane to peel away from the cell wall (**plasmolysis**).



## PRE-TASK QUESTIONS

- What would happen to a plant if you gave them too much fertilization?
- How much salt there is in a cell in normal conditions?

## EQUIPMENT

- Red onions
- Forceps
- A knife
- Salt solutions A, B ja C
- A microscope
- Microscope slides and cover slips
- Pasteur pipettes



## INSTRUCTIONS

You have been given three different salt solutions. The first one contains distilled water (salt concentration 0%), the second one contains 2 % NaCl salt solution and the third one 5 % NaCl salt solution.

You have to use red onion cells to find out the contains of the tubes!

Make a research plan to find out the right solution. When you're ready you can start working. Remember to write down your results! You can also take pictures using the microscope.

Tube	Contains (0 % / 2 % / 5 %)	How did you end up in this solution?
A		
B		
C		

**NB!** Let the plant cells to be in each solution at least 5–10 minutes.

**NB!** Take only red cells from the onion. You can use the forceps to take as thin sample as possible.

**NB!** When using the microscope, take a small drop of the solution on a microscope slide and put your sample in it. Cover the sample with a cover slip.

## POST-TASK QUESTIONS

- What happened in 2 % and 5 % salt solutions? Why?
- How is it possible that some plants can live in a very saline conditions (e.g. a sea-shore)?