Osmosis in plant and animal cells worksheet

FreeReport on problemThe resource is designed for British teachers. View the US version . Effects of osmosis When an animal cell or a plant cell is placed in a medium that is a water solution, the possible consequences are listed below. 1. If the water concentration of the cell cytoplasm is lower, then the medium surrounding the cell (i.e. the medium is a hypotonic solution), then osmosis leads to the cell's access to water. The water molecules freely pass through the cell membrane in both directions, but more water molecules enter the cell than diffuse out with the result that the water enters the cell, which then swells and possibly bursts. 2. If the intra-cell water concentration is the same as that in the surrounding medium (i.e. the medium is an isotonic solution), there is a dynamic balance between the number of water molecules entering and leaving the cell and thus the cell retains its original size. For example, the red blood cell in the blood plasma retains its shape due to the isotonic nature of the plasma. 3. If the concentration of water within the cell is higher, then the medium (i.e. the medium hypertensive solution) the number of water molecules that are emanated will be more than the entry, and the cell will shrink and shrink due to osmosis. Plant cells are closed by a rigid cell wall. When the plant cell is placed in a hypotonic solution , with osmosis it takes water and swells, but the cell wall prevents bursting. The plant cell is said to have become turgid, i.e. swollen and hard. The intra-cell pressure rises until this internal pressure matches the external pressure. This liquid or hydrostatic pressure, called turgor pressure, prevents further net water intake . Turgidity is very important to plants, as it helps to maintain stiffness and stability of plant tissues and each cell exerts turgor pressure on the neighbor by putting together the plant tissue tension, allowing the green part of the plant to stand up to sunlight. When a plant cell is placed in a hypertensive solution, the water inside the cell's cytoplasm is dipterized, and the plant cell is said to have become flaccid. If the plant cell is then detected under the microscopic, they will notice that in the cytoplasm it shrunk and pulled away from the cell wall . This phenomenon is called plasmasis. The process is reversed as soon as the cells are transferred to a hypotonic solution (deplasmolysis). When a plant cell is placed in an isotonical solution, a phenomenon called inpresedent is found. Incipient means soon. Although the cell is not plasmolsysed, it is not turgid. When this happens, the green part of the plant slides down and you can't keep the leaves up in the sunlight. Effect of osmosis in animal cells Animal cells have no cell village. In hypotonic solutions, animal cells swell and explode as they do not because there is no cell wall that prevents the cell from bursting. When the cell is at risk of bursting, organelles called contracts vacuoles pump water into the cell to prevent this. In hypertensive solutions, water is distributed from the cell due to osmosis, and the cell shrinks. Thus, the animal cell should always be surrounded by an isotonic solution. In the human body, the kidneys provide the necessary regulatory mechanism for blood plasma, and the concentration of water and salt removed from the blood by the kidneys is regulated by the part of the brain called the hypothalamus. The regulation of the concentration of water and mineral salts in the blood must be preserved by land-living animals, and so must animals in saltwater, but freshwater animals must have the opposite problem; they need to get rid of excess water as quickly as they enter their bodies with osmosis. Dialysis In a multi-component system, dialysis is a process in which only certain compounds, including both solvent molecules and small dissolved molecules, are able to pass through the selectively permeable dialysis membrane, but other larger components, such as large colloidal molecules such as proteins, cannot pass through the pores of dialysis membranes. Dialysis can therefore be used to separate proteins from small ions and molecules, and thus to purification of proteins needed for laboratory experiments. Examples of membranes through which dialysis occurs are animal vesices, parchment and cellophane (cellulose acetate). The most important medical application of dialysis is in dialysis machines, where hemodialysis is used to clean the blood of patients with renal dysfunction. Patient blood circulates through a long cellophane dialysis tube suspended in an isotopic solution called dialysis, an electrolyte solution containing normal components of blood plasma. The toxic end products of nitrogen metabolism such as urea from the blood pass through the dialysis membrane, where they are removed, while cells, proteins and other blood components prevent their size from passing through the membrane. Dialysis concentrations can also be controlled to correct salt, water and acid-base imbalances in drinking substances. The cleansed blood is then returned to the body. Reverse osmosis Reverse osmosis is the process by which the liquid solvent moves through the semi-permeable membrane against its concentration gradient , i.e. from low solvent concentration to high solvent concentration in the presence of external pressure on the solution . The reverse osmosis process requires a driving force to push the liquid through the membrane, and the most common force is the pressure of the pump. The higher the pressure, the greater the drive. As the concentration of the rejected liquid increases, the concentration of fluid increases. This process is also known as hyperfiltration, as it is one of the best screening methods known. With this method, it is possible to remove particles smaller than ions from the solution. Reverse osmosis is most commonly used for purifying water and desalination. It can also be used to purify fluids like ethanol and glycol, which passes through the reverse osmosis membrane while rejecting other ions and contaminants passing by. Reverse osmosis is able to et away bacteria, salts, sugars, proteins, particles, dyes, etc. Go Premium today gets unlimited access to TeacherVision's entire library of resources. Start the 7-day free trial free of charge until the trial period expires. You can cancel at any time. Substances can move through the cell membrane to and from the cells. The three main types of movement are diffusion, osmosis and active transport. Transport.