Diffusion Pre-Lab

Overview:

One of the functions of the cell membrane is to regulate what enters and leaves the cell. Some molecules are small enough to move through the cell membrane and others are too large. In the following experiment, you will use dialysis tubing to demonstrate the ability of the cell membrane to regulate the movement of molecules into and out of a cell. Dialysis tubing is a special plastic that allows only certain molecules to pass through.

In the lab, you will first use plastic clips to tightly seal one end of the dialysis tubing closed. You will then fill the dialysis tubing ¾ full with a starch-glucose solution. Next, you will tightly clip the tubing closed using another plastic clip. Make sure the tubing does not leak by gently squeezing the filled tubing. The completely filled dialysis tube will next be massed in grams, and then placed in a beaker with just enough water to completely cover the tubing. The dialysis tube must stay in the water for ten minutes.

After ten minutes, remove the tubing from the water, gently dry completely, then mass once again. Next, add a few drops of Lugol's Iodine into your beaker and record your observations of the dialysis tubing and the beaker solution (Lugol's Iodine is an indicator that detects the presence of starch by changing to a dark blue/black color if starch is present). Use the glucose test strip to test for the presence of glucose in the beaker solution (outside of the tubing). If glucose is present you will see a change in color on the test strip.

Empty your dialysis tubing into the sink and clean up your equipment while waiting for the results of your class demo by your teacher. Finally, record the results from your class demo (be sure to clean your second tube as well). Please return all cleaned equipment to the front table for the next class.

While you are conducting your lab, your instructor will setup another demonstration of this same lab experiment that contains starch-glucose solution with amylase (an enzyme that breaks down starch into smaller sugars).

Pre-Lab Questions

1) What is the purpose of the lab?
2) Why will the dialysis tubing act as a model of the cell membrane?
3) What solution goes into your dialysis tubing?
4) Where does your filled dialysis tubing go?
5) How will you test for the presence of starch? How will you know if it is positive?
6) How will you test for the presence of glucose? How will you know if it is positive?
7) What do you think a chemical indicator is?
8) What data will you be collecting? Make a list.
9) What unit will you use to record the mass of your dialysis tubing before and after soaking?
10) What are the materials for this lab? Make a list.

11) What are the procedures for this lab? Make a bulleted list with at least 10 steps. Use the back of this sheet.
12) How will the experiment demonstrated by your instructor differ from the one you are doing?