**Lab Report on Osmosis and Diffusion**

**Biology 1, Period 3 March 15, 2010**

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**Purpose:**

The purpose of this lab is to observe the acts of passive transport: diffusion and osmosis in a model membrane system. The experiment will show how molecules in solution move from areas of higher concentration to areas of lower concentration. The model membrane is dialysis tubing.

**Materials Used**

2.5 cm dialysis tubing 15% glucose solution glucose test strip

1% starch solution distilled water Lugol’s iodine solution

**Procedure:**

**Each member of the lab group will complete the procedures independently**

1. Obtain a 30 cm piece of 2.5-cm dialysis tubing that has been soaking in water. Tie off one end of the tubing to form a bag. To open the other end of the bag, rub the end between your fingers until the edges separate.
2. Place 15 mL of the 15% glucose/1% starch solution in the bag. Tie off the other end of the bag, leaving sufficient space for the expansion of the contents in the bag. Record the color of the solution and weight of the bag in a data table.
3. Test the 15% glucose/1% starch solution for the presence of glucose using a test strip. Record the results in the data table.
4. Fill a 250 mL beaker or cup two-thirds full with distilled water. Add approximately 4 mL of Lugol's solution to the distilled water and record the color of the solution in data table. Test this solution for glucose and record the results in data table.
5. Immerse the bag in the beaker of solution.
6. Allow your set-up to stand for approximately 30 minutes or until you see a distinct color change in the bag or in the beaker. Record the final color of the solution in the bag, and of the solution in the beaker, in data table. Weigh the bag and record the weight.
7. Test the liquid in the beaker and in the bag for the presence of glucose using the test tape. Record the results in data table

Data Table

| **Item** | **Initial Contents** | **Initial Mass** | **Initial Color** | **Final Content** | **Final Mass** | **Final Color** |
| --- | --- | --- | --- | --- | --- | --- |
| Dialysis Bag -Perez | glucose/ starch solution | 30 g | White | glucose/ starch solution | 34 g | Purple |
| Beaker - Perez | H20/Iodine |  | Yellow | H20/Iodine/ glucose |  | Yellow |
| Dialysis Bag -Long | glucose/ starch solution | 24 g | Milky white | glucose/ starch solution | 26 g | Blue-purple |
| Beaker – Long | H20/  Iodine |  | Gold | H20/Iodine/ glucose |  | Gold |
| Dialysis Bag \_ McLemore | glucose/ starch solution | 33 g | White | glucose/ starch solution | 35 g | Purple |
| Beaker – McLemore | H20/  Iodine |  | Yellow | H20/Iodine/ glucose |  | Yellow |

**Results**

The data shows that in each case the bag increased in weight after 30 minutes and that the starch turned blue inside the bag. A glucose test strip showed the presence of glucose in the H2O/iodine solution.

**Discussion/Analysis**

Diffusion is the movement of particles from an area of higher concentration to an area of lower concentration. The diffusion of water into and out of a selectively permeable membrane is called osmosis. Because of the selectively permeable membrane, nothing but water and other very small particles can be diffused through osmosis. The cell membrane is similar to the dialysis tubing, so the cell would lose water because of osmosis if it were placed in an environment in which water concentration is greater than that of the cell. The solution on the dialysis tubing had a higher concentration of solutes (15% glucose, 1% starch) than did the distilled H2O/ iodine solution. The beaker represented a hypotonic solution, one in which the concentration of dissolved substances is lower than the concentration inside the dialysis tubing. Osmosis caused water to move through the dialysis tubing and into the bag. The increase in mass of all three bags showed water moved into them. The dialysis bag represented a hypertonic solution, one in which the concentration of dissolved substances is greater than the concentration outside the bag. Osmosis caused the glucose to move through the dialysis tubing and into the beaker. The test strip for glucose showed than glucose moved out of the ba

**Conclusion**

There was a net movement of water by diffusion into the dialysis tube due to the higher concentration of solute (starch and glucose) inside the bag. There was a net movement of glucose by diffusion out of the dialysis bag due to the higher concentration of glucose inside the dialysis bag.