ANP 1 Lab

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Title: The Cell: Transport Mechanisms and Cell Permeability (Activity 3)

Purpose: The purpose of this experiment was to observe the movement of water through selectively permeable membranes. We observe if diffusion and/or Osmosis is present in the 4 different beakers and sacs that we use. We weigh the sacs before and after in order to see if water went into the sac. We then want to see if the sac diffused into the beaker as well. We use Benedict's test to see if the solutions turn light brown in order to detect if the solution diffuses from the sac to the beaker.

Material: We used in this experiment were 4 beakers labeled, 4 selectively permeable sacs, 20ml 10% NaCl, Silver nitrate, 20ml 40% Sucrose, distilled water in 3 beakers,½ filled a beaker with 40% glucose solution, 20ml 20% glucose solution, weigher, timer

Method: In this experiment, we had 4 beakers, Beakers 1,3,4 were filled with distilled water and Beaker 2 was filled with 40% glucose solution. For each beaker we had a respective sac, Sac 1 contained 20ml of 20% glucose solution, Sac 2 contained 20ml of 40% glucose solution, Sac 3 contained 20m of 20% NaCl and Sac 4 contained 20ml of 40% sucrose solution. After each beaker or sac was filled with its respective solution we made sure that we wiped down the sacs and tied the ends. We took the weight of sac 1,2,3 and 4 and recorded the initial weight. You need to wait 45min before the weight of each sac is taken and recorded again. We then were going to test for glucose or sucrose by using Benedict's solution which turns brown when in contact. Next, we needed to test for Sodium Chloride and see if it was diffused through the sac.

For tubes 3A and 3B, we put in some drops of silver nitrate solution to see if a milky white precipitate was formed. It was observed that it had turned milky white.

Results:

Beaker	Content of Sac	Initial weight	Final weight	Weight change	Tests-beaker fluid	Tests-Sac fluid
Beaker 1 filled with ½ distilled with water	Sac 1, 20ml of 20% of glucose solution	7.1g	8.0g	0.9g	Benedict's test: light brown	Benedict's Test: light brown
Beaker 2 ½ filled with 40% glucose solution	Sac 2, 20ml of 40% glucose solution	6.9g	6.9g	0.0g	Benedict's Test: Positive	Benedict test: positive
Beaker 3 ½ filled with distilled water	Sac 3 , 20ml of 10% NaCl solution	7.2g	7.8g	0.6g	AgNO3: milky white	AgNO3: Milky white
Beaker 4 ½ filled distilled water	Sac 4 20ml of 40% sucrose solution	7.1g	8.0g	0.9g	Benedict's test: Negative	Benedict's test: positive

Our results showed that there was the movement of solutes and water through the sac into the beaker if it was glucose, however since sucrose is a bigger molecule it did not diffuse through into the beaker. Osmosis is the process in which molecules of a solvent pass through a semipermeable membrane from a less concentrated solution to a higher concentration. We know that in beakers 1,2,4 diffusion of water into the sac occurred because there was a weight increase in the different sacs. Sac 1 gained 0.9g, Sac 2 did not gain any weight, Sac 3 gained 0.6g and Sac 4 gained 0.9g. This lets us know that in Sac 1,3 and 4 water moved into the sacs that had the

higher concentration of solutes. The no change of weight for the second sac is because the beaker has 40% glucose and the sac has 40%glucose solution therefore there was no diffusion. We then conduct the Benedict test for Beakers 1,2,3 and 4. When conducting the tests our results showed that when putting the light blue solution in the beaker, the solution turned into a brownish color indicating that there was glucose in beakers 1 and 2.This confirmed that there was a diffusion of glucose from the sac into the beaker. In beaker 4 it had changed colors only in the sac since sucrose is bigger than glucose it was not able to diffuse through the semipermeable sac into the beaker. We then conducted an AgNO3 test on Beaker 3, it was observed that it turned into a milky white solution. This also indicates that the sac had diffused out into the beaker. Overall the experiment was successful in demonstrating cell membrane permeability, as well as osmosis and diffusion.