

Beet cell membrane lab



**ASSIGN
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Title: The effect on temperature on beet cell membranes. Introduction A cell membrane or plasma membrane is very important in protecting cells. A cell membrane is a thin layer that protects the cells. The membrane is filled with lipids and proteins. The cell membrane protects the cell from ions and molecules that enter and exit the cells. I hypothesize that at -5 degrees Celsius, the color intensity will be a 1. I hypothesize that at 5 degrees Celsius, the color intensity will be a 2. I hypothesize that at 22 degrees Celsius, the color intensity will be a 3. I hypothesize that at 40 degrees Celsius, the color intensity will be a 5.

I hypothesize that at 55 degrees Celsius, the color intensity will be a 7. I hypothesize that at 70 degrees Celsius, the color intensity will be a 10.

(Campbell et. al, 2006) Method I really enjoyed doing this lab experiment and am excited for more experiments. The key part about having a successful experiment is to be well organized. Before I started I made sure I had everything out that I was going to need. Next, I wrote down my hypothesis for each piece of beet in the different temperatures. I cut up the beets into 6 exact pieces that would fit into test tube.

Then, I labeled each test tube so I didn't forget which one was which. I ran water over the beets in a beaker for 2 minutes to get the betacyanin off from the damaged cells. Next, I put one beet piece in each test tube. Now that I was set up it was time to start the experiment. I placed tube 5 in the refrigerator and tube 6 in the freezer for 30 minutes. While waiting for those to sit, I moved on to the hot treatments. I started off by using hot tap water to see if the temperature was 70 degrees Celsius. The temperature was a

little low so I placed the beaker in the microwave for a few seconds and checked the temperature again.

Then, I placed the beet from tube 1 into the beaker of water for one minute. After one minute, I placed the beet back into the test tube and covered the beet with room temperature tap water. I did the same for the 55 degrees Celsius, 40 degrees Celsius, and the 22 degree Celsius beets. After 30 minutes of tubes 5 and 6 getting cold, I placed them back on the test tube rack and added some tap water and let them soak for 20 minutes. After 20 minutes of letting all 6 tubes soak, I removed the beets from the test tubes with the dissecting needle so I could see the true color intensity. Results

I was extremely surprised in my results when I finished the lab experiment. I assumed that the beets that were heated would have the higher color intensity and the coldest ones would have the lower color intensity. I was correct about the hot ones but I was wrong about the cold ones. I was also off on the color intensity levels on all test tubes except for test tube 1 which was the 70 degree Celsius one.

Tube number	Treatment ?	C	Color Intensity (0 - 10)
1	70	2	55
3	40	4	22
5	5	6	-5

Discussion The results came out this way because of the stress on the hot and cold temperatures put on the beet cell membranes.

The temperatures make the water seep through the cell membrane and then damage the cells. All of my hypotheses were wrong except for test tube number 1. I was very surprised to find out that the tubes I placed in the refrigerator and freezer damaged the cells. I thought the only factor that would affect the beet would be the heat. I was completely wrong and have

learned something new. There are a few uncontrolled variables that could have affected the experiment. The first one would be if the beet pieces were not the same exact size. If one beet piece was bigger than the other, that tube would get darker because it has more beet in it.

Another uncontrolled variable would be if the temperatures were not correct. If they were not correct the membranes would not be affected as much. Lastly, if you didn't let the beets soak long enough the color intensity would be off. Working in the medical field, learning about cell membranes is very crucial. Especially if you work in a laboratory. You need to know the functions of cell membranes and what the cell membrane consists of. For example, the cell membrane consists of lipids and proteins. The lab about beet cell membranes has helped me learn how all temperature can affect the cell membranes.