Membrane permeability in beetroot cells essay

Beet root cells contains a red pigment, which is found in the cell vacuole. The vacuole has a membrane in which its function is mainly to prevent the betacyanins from leaving the cell. Leakage of these betacyanins into the external solution can be used as an indication of membrance pereambility changes. As part of my experiment, my aim is to see if temperature affects the membrane by witnessing the amount of betacynanins that leaks from the beetroot cells.

The cell membrane covers the outside of a cell and consists of a double layered sheet of lipid molecules interspered with proteins. It seperates the cell from the external environment, gives phyisical protection and allows the import and export of selected chemicals.

Aim:

I will commence the experiment by placing beetroots in a test tube of deionised water, I will use a range of temperatures in which I will place the beetroot cell to see the damage later on. After placing them in series of test tubes of deionised water for 30 minutes. I will pour out each solution into a cuvette and place it in a colorimeter, This will enable me to witness variations in my experiment.

Prediction:

My prediction to this investigation is that, as the tempertaure of the deionised water increases, so will the membrane permeability of the beetroot cell. In doing so, this will cause the beetroot release more

betacyanins, because high temperatures have a tendency to damage cell membrane, thus releasing the red pigment (betacyanin).

If the cell membrane and the cell wall are damaged due to high temperature, there will be nothing to prevent the betacyanin from ecsaping the beetroot cell. Hence Membrane permeability would increase.

Variables :

* Time; It is essential that the beetroot cells are placed in the deionised water for the same exact period of time, to ensure this is a fair test.

* Tempertaure; Tempertaure plays an important role in this practical. The tempertures have to be kept at chosen temperatures to make sure the results are accurate as possible, and also so that unnecessary damage is not caused to the membrane. I will place thermometers in each temperature bath to make readings a lot easier. Also this will enable me to measure the amount of betacyanin lost in the beetroot cells.

Some of the measuring techniques that I will use during this experiment will be.

* A ruler; This equipment will enable me to measure the beetroot cells accurately and to ensure that the beetroot cells are all the same sizes.

* Digital stopwatch; This will enable me to ensure the beetroot cells stay in the deionised water for the same exact time.

* Measuring cylinder: The amount of deionised water in each test tube has be exactly the same. Otherwise this will create an error in my experiment.

Therefore using a measuring cylinder enable my experiment to be fair and accurate.