The cell membrane narrative

Cell membrane is the focus of this laboratory experiment. The plasma membrane has got three components namely cholesterol, protein, and phospholipid (glycerol and charged phosphate). The molecules of phospholipid have got one water soluble end (hydrophilic) and the other end which is not soluble in water (hydrophobic). The hydrophilic head is composed of glycerol, negatively charged phosphates, and choline or serine groups. On the other end (tail), the hydrophobic end of phospholipid is made up of long chains of hydrocarbon. Given its amphipathic nature of the phospholipids, they assemble in cells as bilayers giving the plasma membrane its two leaflet of phospholipids that sandwitch the single protein layer. The aim of this experiment is to determine whether Kool-Aid is hypertonic, hypotonic, or isotonic to a 10% sucrose solution. The experiment will use dialysis tubing to simulate the effects of a semi-permeable membrane. Each piece of the four tubing will be tied at the bottom, filled with 5 mL of 10% sucrose, weighed to determine their mass, and then placed separately in beakers containing 100mL of de-ionized water, 10% sucrose, 30% sucrose, and Kool-Aid. The new masses in the tubes were determined after one hour. My hypothesis for the experiment is that Kool-Aid is hypertonic. This is based on the knowledge that hypertonic solutions draw water out of the hypotonic solution. It is predicted that the two control tubing will lose mass when both placed in Koo-Aid.

When the dialysis bag containing 10% sucrose was placed in beaker containing de-ionized water, the bag gained weight by 1. 06g. This means that the bag was placed in a hypotonic solution. When the bag was placed in the second control solution containing 10% sucrose, there was a slight

change in weight of the bag (0. 01g)-an indication that the solution was isotonic. In the third solution (30% sucrose), the bag lost weight after one hour by a margin of 1. 31g; the solution is hypertonic. While in the Kool-Aid, there was a negligible change in the mass (0. 17g) – an implication that the two solutions were isotonic. In terms of weight changes, the bag placed in Kool-Aid resemble the control solution that contains 10% sucrose whose total whose total weight change is 0. 01g. Therefore 0. 17g is closer to 0. 01 than 1. 06g and 1. 31g.

Suppose Kool-Aid was prepared by dissolving 120g of sucrose in 1 liter of water, the percentage of sucrose solution in the Kool-Aid is given by:

Percentage of sucrose solution= (mass of sucrose/mass of 1 liter solution)*100

= (120/1000)*100

= 12% sucrose solution.

If a dialysis bag containing 10% sucrose solution is placed in the grandmother’s Kool-Aid, it would lose weight because the grandmother’s Kool-Aid solution is hypertonic to the dialysis bag. The Kool Aid of the grandmother is sweeter than the one I used in the lab for experimental purposes.

The experimental prediction was that the Kool-Aid was hypertonic to the dialysis bag containing 10% sucrose solution based on my hypothesis. Hypothesis: Kool-Aid is hypertonic to the 10% sucrose solution used as a control solution. The outcome of the experiment did not match my predicted

experimental outcome because the Kool-Aid sucrose was isotonic to that of the standard control solution in the dialysis bag (10% sucrose solution). My hypothesis was that the Kool-Aid was hypertonic to the dialysis bag containing 10% sucrose solution. The data falsified my hypothesis because when dialysis bag was placed in Kool-Aid, there was not significant change in mass against my prediction that there would be. Mass of dialysis bag before and at the end of experiment is 5. 51g and 5. 34 respectively.