

Veronica guerrero

Nutrition



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Veronica Guerrero Macromolecules of Life The macromolecules of life experiment involves the biology of life. The biology of life includes carbohydrates, lipids, proteins and which will not be included in this experiment nucleic acids. The introduction of this experiment will reference how to become familiar with lipids, carbohydrates, and proteins. It will also include the knowledge of how these macromolecules function in living organisms. This experiment will identify the macromolecules with the use of test substances to identify each. In my first experiment to test for proteins the egg white with the Biuret reagent should come out positive for being a protein. The pepsin in the Biuret reagent should be positive and should be a protein. The test for sugar in the Biuret reagent should be negative and I don't think it is a protein. The test with the distilled water with the Biuret reagent should be negative and is not a protein. In the second experiment to test for glucose with the Benedict reagent sugar should be positive for glucose. Starch mixed with the Benedict reagent is probably positive for glucose because it is a polysaccharide. Onion juice mixed with Benedict reagent is probably positive for glucose because it is a fructose. Distilled water with Benedict reagent should be negative for glucose. The third experiment to test for starch using with and without the IKI reagent by looking under a microscope a slice of potato cells should have several shapes to it and with the IKI reagent should look have more of a stronger shapes and color to it. The onion cells should have a more stringy look to it and with the IKI more color. The fourth experiment is testing for lipids using the Sudan III on a potato, onion, oil and dH₂O. I believe the oil will determine it is a lipid. The fifth experiment the chemical bonding of mixing an egg yolk, vegetable oil and vinegar should make mayonnaise as long as you

continually mix a good amount of vegetable oil and mix well. Procedure used in Experiment 1: " Testing for Protein" Using 4 test tubes marked 1, 2, 3, 4 I measured 2cm on each. I then separated the egg whites from the yolk. I mixed 30ml of dH₂O with the egg white and whisked it with a fork. Added 10ml of dH₂O to the Pepsin 0. 1g mixed and shook well and placed it in the refrigerator. Test tube #1-placed the egg mix, #2 placed pepsin #3 placed pinch of sugar and dH₂O, #4 with dH₂O. Added 16 drops of the Bluret reagent to #1 until the color turned purple. Proceeded to place the same amount of drops in the remaining test tubes and recorded my observations in the table provided. Cleaned the test tubes and followed the next experiment. Procedure used in Experiment 2: " Testing for Sugars" Prepared a hot water bath using a small saucepan about 2 inches deep and submerged the test tube rack into the pan. Brought the water to a boil and proceeded to turn down the heat to its lowest setting. Marked the all 4 test tubes with 2cm at the top and 5cm at the bottom. Prepared 19ml of dH₂O into the graduated cylinder adding 20% glucose solution and poured into a clean container covered and placed in the refrigerator. Prepared the grinded onion juice and placed 0. 5cm in the bottom of test tube #3. Placed 0. 5cm of the 1% starch solution into test tube #2, placed dH₂O to the 0. 5cm into test tube #4 and placed 0. 5cm of the glucose solution into test tube #1. Added Benedicts reagent to the 2cm mark of all the tubes. Placed all tubes into the hot water bath for 5 minutes. Turned the heat off and use the test tube holder and carefully examined the contents of each test tube. Recorded observations in the table provided. Procedure used in Experiment 3: " Testing for Starch" Using a 1cm² slice of potato placed under the microscope slide and added a drop of dH₂O and covered it with a

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microscope slide cover slip. Observed the potato cells under a microscope and recorded in the table provided. Observed same potato cells with the IKI solution and recorded in the table provided. Repeated procedure using onion cells to determine which of the two has the most starch. Procedure used in Experiment 4 "Testing for Lipids" Using the foil and filter provided placed 4 drops of Sudan III stain(fat soluble dye) to the filter. Used a pencil after stained dried and traced a circle to outline the drops. I cut a small 1 cm cube of potato and put into the mortar and pestle to grind up the potato pieces adding 2ml of dH₂O. Labeled a pipette " potato juice" repeated the same process for onion juice. Labeled a pipette : " onion juice" One pipette labeled vegetable oil and another labeled dH₂O. Placed 1 drop of each substance (oil, dH₂O, potato, and onion) onto each Sudan III circles. I waited a few minutes and recorded results in table provided. Procedure used in Experiment 5 " Making Mayonnaise" Used the egg yolk left over from the first experiment, added 25ml of vinegar and slowly added as much vegetable oil needed (one cup) to get the consistency of mayonnaise and added a pinch of salt to taste. Exercise 1: Testing for proteins Data Table 1: Biuret results.

| Substance Tested | Predicted Results | Biuret Color | Number of drops added |
|----------------------|--------------------|--------------|-----------------------|
| 1: Egg white Protein | Protein | 16 drops | 2: Pepsin Protein |
| Protein | 16 drops | 3: Sugar | |
| no 16 drops | 4: Distilled water | | |
| no 16 drops | | | |

Exercise 2: Testing for Sugars Observations Data Table 2: Benedict's Reagent Results. Test Sample Predicted Results Benedict's results

| # | Sample | Predicted Results | Benedict's results |
|----|-----------------|-------------------|--------------------|
| #1 | Glucose | red | Dark red |
| #2 | Starch | red | blue |
| #3 | Onion juice | Light brown | Yellowish brown |
| #4 | Distilled Water | blue | blue |

Exercise 3: Testing for Starch Observations A. Write a hypothesis about whether a potato or onion has the most starch. I believe a potato has more starch based on knowing onion hasve more sugar than starch. Observations

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Table: Exercise 3 A. View of potato under pocket microscope. Magnification

= The view of the potato cells are of several bubble looking packed cells.

Color was slightly clear white but the outside of the cells were a darker

white. B. View of potato cells with IKI. Magnification = After applying the IKI

the cells looked more packed than without the solutions. Had more of a

darker color of brownish gray Observations Table: Exercise 3 A. View of onion

cells without IKI. Magnification = The onion cells had a light gray look under

the microscope. B. View of onion cells with IKI. Magnification = The view of

the onion cells with IKI looked stringer and darker color of gray Exercise 4:

Testing for Lipids Observations Data Table 3: Lipid test results.

Macromolecule Being Tested Hypothesis: contain lipid or not Results from

test Potato not not Onion not not Oil lipid lipid dH₂O not not The analysis of

the result of this experiment is to become familiar with proteins,

carbohydrates and lipids. The functions of how sugars, starches and proteins

react with different substances. The experiment did show the majority of my

hypothesis to be correct. The onion juice is a fructose making it a sugar. It is

a protein and Sugar is a carbohydrate and potato is a starch which is a

conclusion I already knew Ex 1: A. which of the test tubes are the positive

and negative controls: Egg whites: Positive Pepsin: Positive Sugar: negative

dH₂O: negative B. What conclusions can be made about this experiment?

Protein is found in eggs C. How might Biuret reagent be used in a practical

real-life situation? It detects peptides which make up proteins. D. How did

the predicted results compare to the actual results? The actual results did

compare with my predicted results. Ex 2: A. Which of the test tubes are the

positive and negative control? Glucose= Positive Starch= negative Onion

juice= positive dH₂O= negative B. How did the predicted results compare to

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the actual results. The predicted results were correct as far as I know. C. What can be concluded from this experiment? In testing for sugars Benedict solution is a copper it reduces the sugar. D. How might Benedict's reagent test be used in a practical real-life situation? In real life solutions this test would be good for glucose in urine. Ex 3: Which vegetable has the most starch? Potato showed to have more starch than the onion.. What is the purpose of starch in vegetables? Starch is a complex carbohydrate that your body uses for energy. How might the IKI reagent test be used in a practical real-life solution? h I not sure this test can be used in real life situation Did the results differ from your hypothesis? Explain the results did not differ from my hypothesis because potato is a starch that appeared clearly under the microscope. Ex. 4: What is the test substance ? Sudan III Which test represents the control? The test of lipids are not water soluble Which test contained the most test substance? Vegetable oil Did the results agree with the initial hypothesis in every case? Explain why or why not? Yes the results agree the oil spread beyond the sudan iii oil is not soluble The onion came close but the potato and water are soluble. Ex 5: If you were given a piece of hot dog and a piece of carrot, using what you learned in thes exercises, how would you analyze the composition of these materials? A hot dog in water you will see the oil float on top. You now know that hot dog has oil on it. If you stick the carrot in water, you will not see any oil float up. What classes of compounds are present in living organisms that are not tested for in this exercise? Nucleic acids are not tested in this exercise