

Discussion and results of macromolecule station lab

[Science](#), [Biology](#)



Fruit punch and almond milk were the two foods continually tested throughout the duration of the macromolecule station lab. To begin, the macromolecule present within fruit punch includes carbohydrates, specifically monosaccharides (e. g. fructose). When the positive control for monosaccharides was heated the solution turned dark yellow or orange, became opaque, and began to evaporate. These results when compared to the sample of fruit punch were identical as the previously red solution represented that of a dark orange color, became opaque, and also began to evaporate when heated. Furthermore, the macromolecule present within almond milk includes proteins, specifically amino-acids. When the positive control for proteins was obtained, the bubbly translucent solution turned light purple or pink when six drops of biuret solution were added. Similarly, when the same amount of biuret drops were added to the almond milk, the solution also showcased a light pink or purple color. Therefore, the two macromolecules present in the foods that were tested include carbohydrates, specifically monosaccharides for the fruit punch, and proteins for the almond milk.

1. There are eight amino acids which are essential to the human body. Leucine is an example of an essential amino acid that is found in our bodies. The amino acid's function in the human body is to help maintain and regulate the bodies nitrogen and energy supply.
2. There are many foods that are rich in leucine such as peanuts, chicken, almonds, soybeans, beef, lentils, oats, pork, fish, chickpeas, corn, rice, and any sort of dairy product.

3. Although deficiency in leucine is rare, individuals with a strict vegan or vegetarian diet are more inclined to have a deficiency of this amino acid. Individuals who are deficient in leucine tend to experience dizziness, fatigue, depression, confusion, irritability, and headaches.

Cellulose is a carbohydrate, specifically a polysaccharide, which is found within plants and vegetables. The function of cellulose is to give structure and support to plants and is also crucial in forming the cell-wall within plants cells. Cellulose adds fibre to our diet but is not able to be fully digested or broken down by the human body. Cellulose passes through our digestive tract unaltered as humans do not produce the necessary bacteria or enzymes (e. g. cellulase) required to break down the 1-4 beta glucose bonds that hold the polysaccharide together. Therefore, the human body cannot break down cellulose into glucose molecules resulting in unaltered chains of glucose also known as fibres.

Although steroids tend to receive a bad reputation due to their negative influence on sports and body-building competitions, these lipids are very biologically important. Steroids are hydrophobic, insoluble in water, and composed of four carbon rings. To begin, steroids such as cholesterol function within the nervous system, as part of the cell membrane providing structure and support to the membranes. In addition, sex hormones such as testosterone or estrogen are another example of steroids, which actually stem from a cholesterol molecule. Lastly, steroids are also important due to their prevalence within the medical field as they are used in anesthetics due to their ability of suppressing the receptors which communicate with the

brain. Therefore, even though steroids tend to receive a bad reputation due to many factors, these lipids are crucial in supporting human life.

When discussing the structure of carbohydrates, it is important to note that the composition of these macromolecules is important in facilitating their function. The primary function of carbohydrates is to provide quick energy upon digestion in the form of ATP (Adenosine Triphosphate). Carbohydrates are composed of carbon, oxygen, hydroxyl, and methanol bonds in a ring formation, making them polar and soluble in water. Therefore, during the process of hydrolysis or metabolism, these high energy bonds are broken down into ATP molecules which provide quick energy to the cells within the body.

It is important knowing about the major biological macromolecules (e. g. carbohydrates) as it provides a greater understanding of the foods that we consume daily and how they impact our bodies. In turn, helping make healthier nutrition choices and diets that not only suit our body but help it function properly as well. Based on what I have learned throughout the biochemistry unit, I plan to regulate the number of saturated fatty acids I consume (e. g. butter). Even though lipids are essential for life they are also prone to clogging up the arteries within the body increasing the risk of a heart attack or other cardiovascular diseases. Therefore, knowing about these biological molecules will assist me in constructing a diet that is healthier for me.

Nucleic acids are another biologically important macromolecule which are composed of nucleotide monomers and include DNA (deoxyribonucleic acid) and RNA (ribonucleic acid). Nucleic acids are responsible for storing the genetic information of all organisms. However, for that genetic information to be expressed within an individual (e. g. human) it must be in the format of a protein, specially an amino acid sequence. Therefore, resulting in the information storage being handled by nucleic acids and the expression of the genetic information being handled by the amino acid (protein) sequences.

It was important to complete the positive and negative controls for each of the stations prior to testing the food in order to minimize the impact of other variables which may have affected the main independent variable being tested. A positive and negative control are used within experiments to add validity to the claim being made and, in this case, helped determine which macromolecules were in the foods being tested. In the negative control group there is no reaction expected, while in the positive control group there is a reaction expected. In this case, the negative control group was water as it would not react to any solution (e. g. iodine). While the positive control group included macromolecules (e. g. proteins) which were expected to react to heat or solutions such as iodine. Therefore, it was important to complete the positive and negative controls to add validity to experiment and help determine which macromolecules were in the foods being tested.

Conclusion

In conclusion, the macromolecule present within fruit punch includes carbohydrates, specifically monosaccharides (e. g. fructose). While the

macromolecule present within almond milk includes proteins, specifically amino acids. The hypotheses presented prior to conducting the experiment were: " If fruit punch is tested, then the macromolecule present will be carbohydrates, specifically monosaccharides" as well as, " If almond milk is tested, then the macromolecule present will be a protein". After completing the lab, both hypotheses are confirmed as the results showcase fruit punch contains a carbohydrate macromolecule and almond milk contains the protein macromolecule. All in all, the macromolecule station lab was an overall success as both hypotheses were confirmed and experimental errors were minimized to the best ability.