**Study Guide**

**Macromolecules**

**Lecture learning goals**

* Describe carbohydrates—their structure and function.
* Describe lipids—their structure and function.
* Describe proteins—their structure and function.
* Describe nucleic acids—their structure and function.

**Guiding questions**

1. List the 4 macromolecules of life. Where do most of these come from? Describe the general structure and function of each of these macromolecules.

2. Contrast the amount of energy stored in carbohydrates, lipids and proteins. How does this explain the way we store excess calories on our bodies?

3. Many foods, such as potatoes, contain starch which is a polysaccharide. How does the release of energy from starch differ from that of glucose, a monosaccharide?

4. Some carbohydrates are not digestible but it is still important for humans to consume them. Name one such carbohydrate and why is it an important dietary component.

5. Distinguish the structure and function of the 3 types of lipids.

6. Contrast saturated and unsaturated fatty acids. Which are better for consumption and why? What are *trans* fats? Compare them to saturated and unsaturated fatty acids. Now which is worse?

7. Even though you consume protein and proteins are made of amino acids, you find out that you are missing some amino acids from your diet. What are these amino acids?

8. Differentiate the 4 levels of protein structure. Why is protein structure important?

9. When someone gets a perm, the chemicals in the perm act on the protein in the hair. What is this perm doing to these proteins?

10. What are the 3 differences between DNA and RNA?

11. Classify each of these as one of the 4 types of macromolecules: starch, fiber, RNA, an enzyme, cell membranes.

**Blasts from the past (i.e. old test questions)**

Which of the following is **NOT** a fate for glucose in your body?

A. Fuels cellular activity

B. Stored temporarily as glycogen

C. Converted to fat

D. Broken down into a simpler monosaccharide

Which of the following statements about lipids is INCORRECT?

A. Humans tend to eat foods high in fats. Since lipids provide a large amount of energy, we only use a small portion of the amount we consume and we store the rest as body fat.

B. Excess energy is stored as fat for the long term because you can store more than twice the energy in 1 pound of fat as you could in 1 pound of carbohydrates or proteins.

C. Fats provide more energy than carbohydrates or proteins because most fats are unsaturated and thus more triglycerides can be packed tightly together, resulting in a solid at room temperature.

D. All of the above are correct.

DNA is made of

A. glucose molecules

B. nucleotides

C. triglycerides

D. amino acids

The silk of a spider's web is remarkably strong and its tensile strength is comparable to that of steel. Spider silk is a

A. carbohydrate

B. non-carbon containing molecule

C. protein

D. lipid