

Biological Molecules:

The study of the structure and functioning of biological molecules forms an important branch of biology known as molecular biology. It is very closely linked with biochemistry (organic chemistry) which looks at the chemical reactions of biological molecules. The sum total of all the biochemical reactions in the body is known as metabolism. It is complex but has an underlying simplicity based on the fact that there are only 20 common amino acids used to make all naturally occurring proteins. The manufacture and interactions must be controlled and regulated and, the more there are, the more complex the control becomes. Our understanding of how structure is related to function is critical to comprehension of life.

Listed below are the biological molecules we will be studying. Prepare a flashcard for each of the concepts. Define each term and include a structural formula of each term. Describe the basic structure and properties of each and how they are related to their functions in living organisms. The front of the index card should include the word and the structural formula, the remainder of the above information should be recorded on the reverse side of the index card. Summarize and record in form of bullet points.

Please use color to designate the elements in your diagrams. Carbon should be black, nitrogen blue, oxygen red, hydrogen is normally white but use green instead so that we can see it. For all other elements, you may choose your colors.

1. The three main types of carbohydrates:
 - a. Monosaccharides
 - b. disaccharides, and
 - c. polysaccharides. (each on their own card)
2. Forms of glucose: alpha- and beta-glucose: include the structure of the ring forms of both.
3. Glycosidic bonds: include the formation and breakage of a glycosidic bond and its significance.
4. Polysaccharides:
 - a. starch,
 - b. glycogen
 - c. cellulose
5. Triglycerides and phospholipids
6. Saturated and unsaturated fatty acids and lipids. How are they different from each other?
7. Proteins, amino acids, and the peptide bond.
8. Protein structures:
 - a. primary,
 - b. secondary,
 - c. tertiary,
 - d. Quarternary.