

Biomolecules / Macromolecule

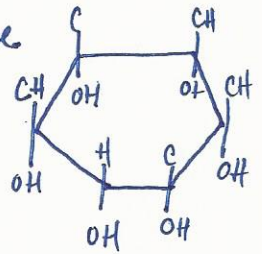
- 4 major Biomolecules: Carbohydrates, Nucleic Acids, Lipids, Proteins
- Monomers + Polymers of each Biomolecule: Monomers make Polymers: Polymerization
- Biomolecules are Organic because they contain Carbon.
- ALL biomolecules have 3 basic elements: Carbon, Hydrogen, & Oxygen (CHO)

Carbohydrates: Structure looks like a stop sign

- Composed of 1-carbon, 2 Hydrogen, 1-oxygen (1,2,1-Ratio)
- 3 Types of Carbohydrates - Monosacchride, Disacchride, Polysacchride
- Are essential/Main energy source for humans, Cellular support for plants, fungi, animals

1) Monomer of Carbohydrates: Monosacchride - one sugar molecule

- Shortest energy source, Ex: Candy, sugar, & Honey.
- Looks like 1 - Stop Sign. Mono = 1, sacchride = sugar



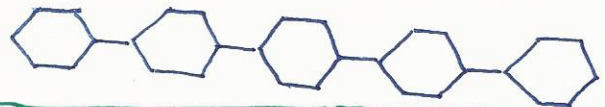
2) Dimer of Carbohydrates: Disacchride - 2 sugar molecules

- Medium source of energy: Ex - Fruit, (Fructose)
- Looks like 2 Stop Signs put together



3) Polymer of Carbohydrate: Polysacchride - 3 or more sugar molecules.

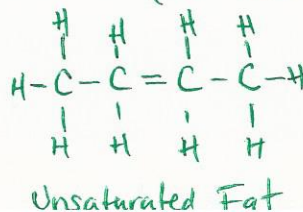
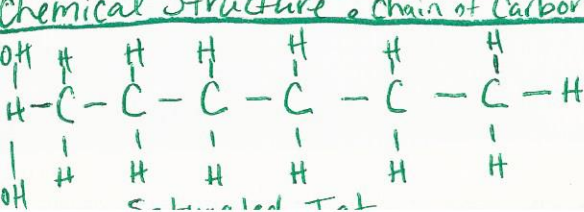
- Longest source of energy - if not used, it will be stored
- Ex: Pasta, Bread, Crackers structure:



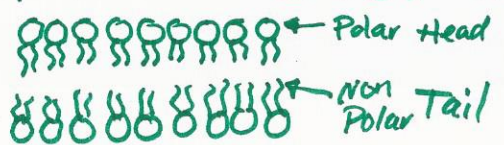
Lipids: Are fats, oils, and waxes. Monomer: Fatty Acid Polymer: Lipid

- Stores energy, made mostly of carbon and hydrogen
- 3 different structures: Stearic Acid, oleic Acid, phospholipid
- Polar section of Lipid likes water (Head) (Hydrophilic)
- Non-Polar section of Lipid does NOT like water (Tail) (Hydrophobic)

Chemical Structure of chain of Carbon



physical structure: Zipper



Phospholipid Bi-Layer

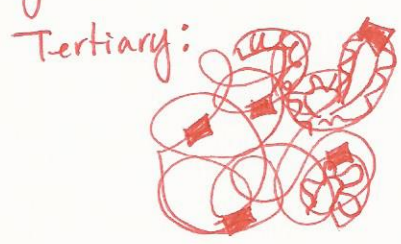
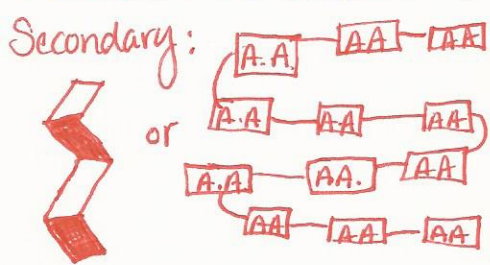
Proteins: Most important Biomolecule, because it makes up 90% of our body's Functions.

Functions: Transports oxygen + Nutrients + Molecules, Repairs tissues and muscle, Helps fight Diseases, Helps w/ Body Temp., Carries out chemical Reactions (Enzyme)

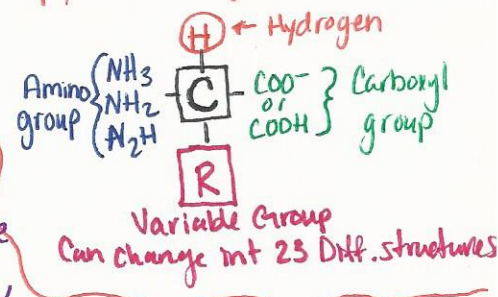
Monomer of Protein: Amino Acid (AKA Building blocks of protein)

Polymer of Protein: Protein

Structure of Protein: Primary - AA - AA - AA - AA - AA - AA



Structure of Amino Acids have: Hydrogen, Carboxyl Group, Variable group, amino group, and Carbon at the center.

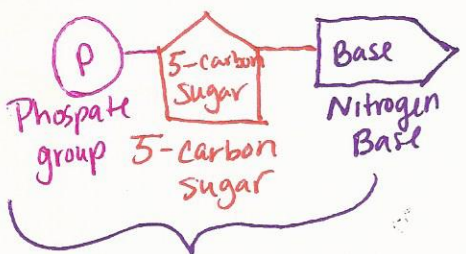


Nucleic Acids: Makes up our genetic Material

• Has 3 parts to it: Phosphate, 5-carbon sugar, Nitrogenous Base

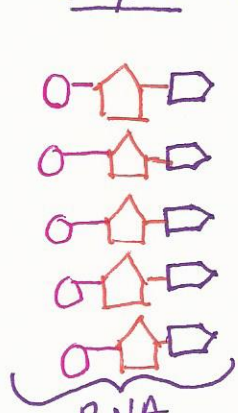
• 2 Types: DNA - Deoxyribonucleic Acid, RNA - Ribonucleic Acid

• Monomer of Nucleic Acid - Nucleotide • Polymer - Nucleic Acid

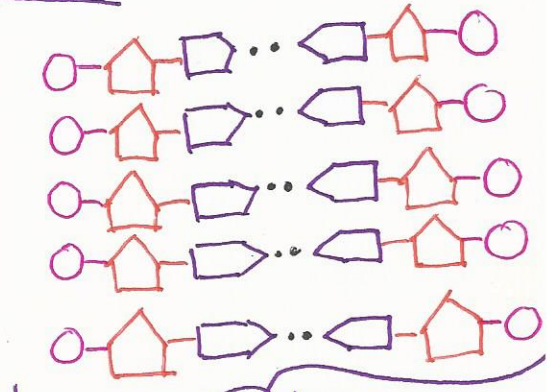


Nucleotide (monomer)

• Nucleotide is made up of 3 structures - phosphate, sugar, Base



RNA (polymer)



DNA (Polymer)

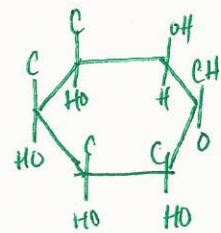
Biomolecules/Macromolecule/Polymer

- 4 Types: Carbohydrates, Lipids, Nucleic Acid, Proteins
- All biomolecules contain Carbon, Hydrogen, & Oxygen (CHO)
- There are Monomers: Smaller structure that makes up the Biomolecule.
- There are Polymers: ^(Large) Molecules made from repeating Monomers.
- Many monomers come together to make a Polymer. = Macromolecule
- Carbon is found in ALL biomolecules, making them organic.

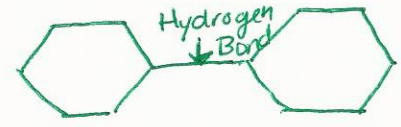
Carbohydrates: Central/main energy source of an organism.

- Ratio of elements: 1 Carbon, 2-Hydrogen, 1 Oxygen
- Found in Humans, Animals, + insects.
- Monomer of Carbohydrate: Monosacchride, Mono=1, sacchride = sugar
- Dimer of Carbohydrate: Disacchride, Di=2
- Polymer of Carbohydrate: Polysacchride, Poly = Many

• Monosacchride: Short energy source
 Ex: Candy, Sugar, Honey
 Structure of monosacchride: Looks like 1 stop sign



• Disacchride: Medium source of energy.
 Ex: Fruit Structure of Disacchride: 2 stop signs



• Polysacchride: Largest + most amount of Energy
 Ex: Bread + Pasta + Potatoes
 Structure: 3 or more stop signs (Many)



- Cellulose - Found in plants (makes up cell wall)
- Many monomers make up a polymer = Polymerization

Lipids: Fats, oils, + waxes

Function: Stored energy source, in plants, used to prevent water loss.

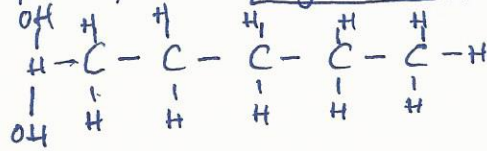
Physical structure has 2 parts: Head - Hydrophilic (Likes water) Polar → } Monomer
 Tail - Hydrophobic (Doesn't like water) Non-Polar → } Fatty Acid

} Polymer: Lipid (Phospholipid Bi-Layer) 2 Types of Lipids: Saturated + Unsaturated

Structure of lipid contains Carbon and Hydrogen (Chain of Carbon + Hydrogen)

Saturated: Solid Fats, Bad fats: Ex: Butter, Lard, Crisco Single Bond

• Sometimes has oxygen



Unsaturated: Liquid Fats, Good Fats, Ex: Cooking Oils, Canola, PAM, Olive, Coconut

double bonded structure (one or more double bonds)

• Sometimes has oxygen

