

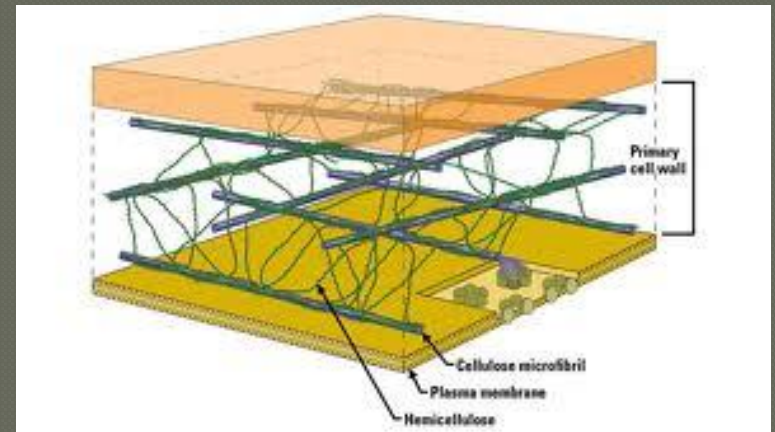
Biochemistry-Macromolecules

- 4 types
 - Carbohydrates
 - Lipids
 - Proteins
 - Nucleic Acids

Carbohydrates

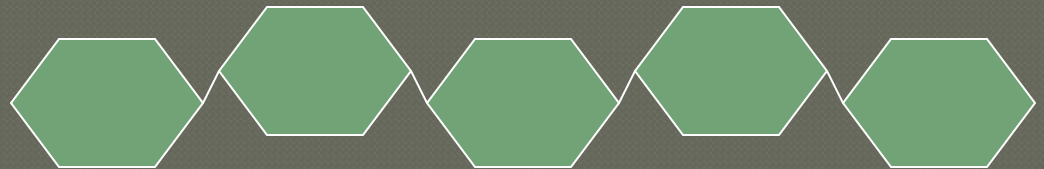
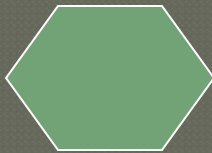
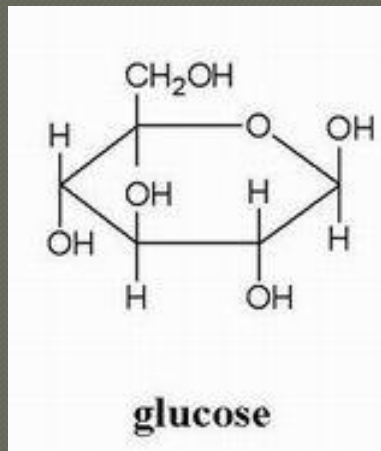
Function of Carbohydrates

1. Energy source!!!
 - Energy is stored in the C-H bonds
2. Plant Structure
 - Cellulose is a carbohydrate found in the cell wall of plants
 - We can eat cellulose, but we can't break it down and use it for energy
 - It is a source of dietary fiber



Carbohydrate Structure

- Subunit is sugar, a simple carbohydrate
- Sugars end in -ose
- Many sugars linked together makes **starch**, a complex carbohydrate



Structure (continued)

- Contain C, H, O in a 1:2:1 ratio

Example: Glucose

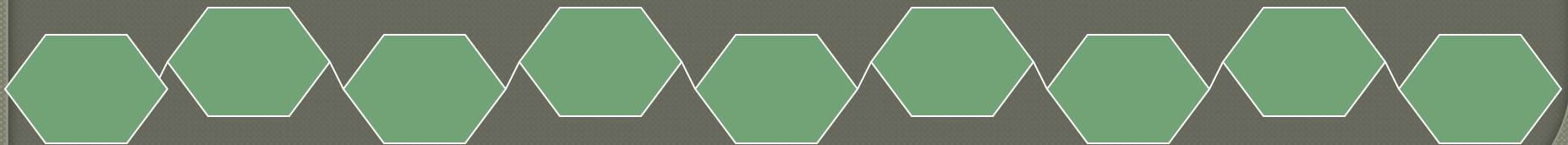
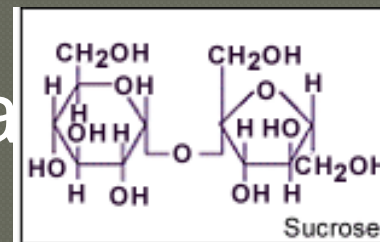


Carbs are also called saccharides

- Monosaccharide – 1 sugar

- Disaccharide – 2 sugars

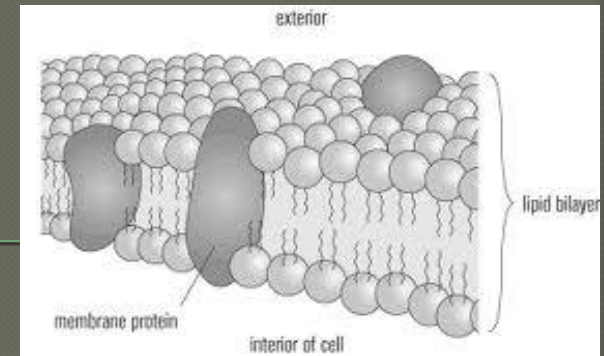
- Polymer – many



Carbohydrate Example

- ◉ Foods high in Carbohydrates
 - Bread, Cereal, Pasta, Potato

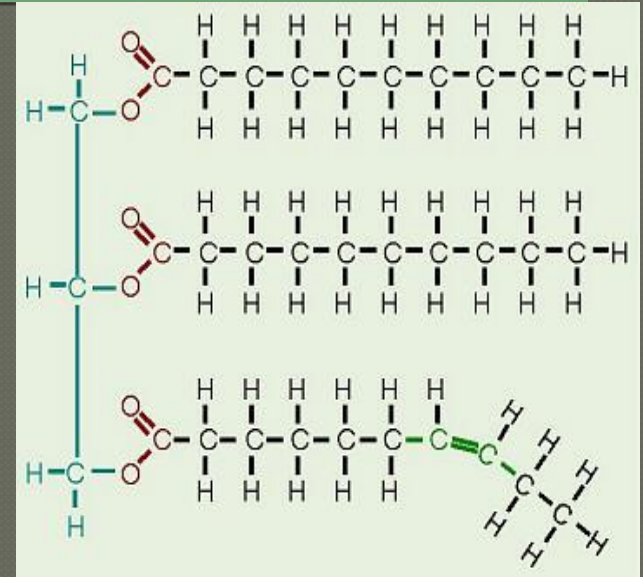
Lipids



1. Long term energy storage
 - Fats have more energy than carbs
 - Our bodies store unused energy in fat
2. Form cell membranes
3. Steroid hormones (testosterone)

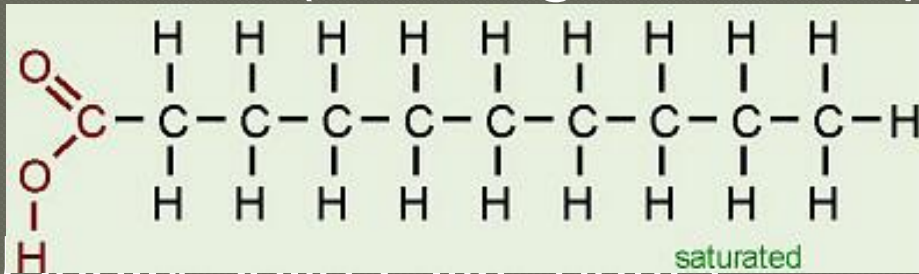
Structure

- Lipids are **NONPOLAR** and cannot dissolve in water!
- Subunit is fatty acid
 - 3 long chains of C and H
 - Elements included C, H, O and some have P



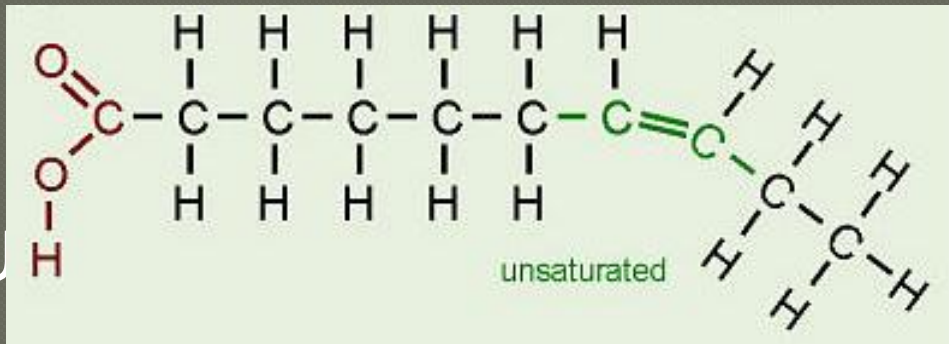
Structure (continued)

- Saturated (all single bonds)



- Usually solid, like butter

- Unsaturated (1 or more double bonds)



- U

Lipid Examples

- ◉ Fats, oils, and waxes
- ◉ cholesterol and hormones

Protein

Function of Proteins

1.) Structural:

Collagen:

- Forms cartilage and tendons

Keratin:

- Forms hair

2.) Functional:

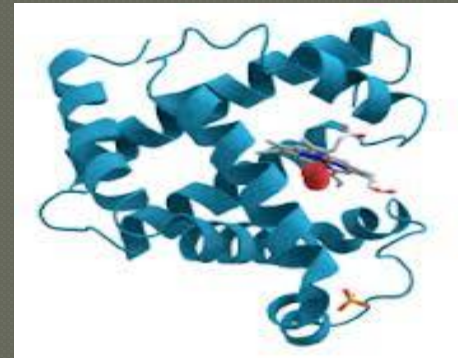
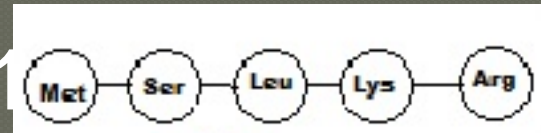
Some transport things (hemoglobin transports oxygen)

● ENZYMES – end with –ase (catalase)

- Help chemical reactions by speeding them up; This is very important for bodily functions, like metabolism

Protein Structure

- Proteins are made of subunits called amino acids (AA)
- There are 20 (AA).
- The average protein has 1



Example of food high in protein

- ◉ Steak, Chicken, Insects, Eggs, nuts



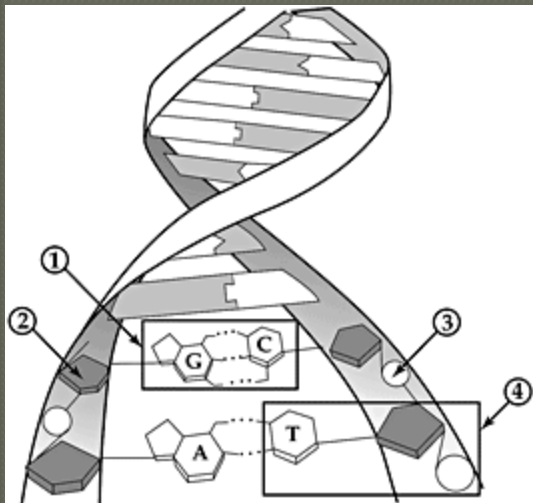
Nucleic Acids

Function of Nucleic Acids

- Store and transmit genetic information.
- Direct the formation (synthesis) of new proteins

Structure of Nucleic Acids

- Nucleic Acids are made up of Nucleotides
 - Nucleotides have 3 parts
 - Sugar, Phosphate, Nitrogenous Base
 - 5 types of nitrogenous bases
 - Adenine, Guanine, Cytosine, Thymine(DNA only), Uracil (RNA only)



Examples of Nucleic Acids

- ◉ DNA-Deoxyribonucleic acid
- ◉ RNA-Ribonucleic acid
 - 3 main types of RNA
 - mRNA(messenger)- takes genetic information to the ribosome
 - tRNA(transfer)- carries amino acids for protein synthesis
 - rRNA(ribosomal)-makes up ribosome and aid in protein synthesis.

