

Cells: The Basic Units of Life





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The Cell Theory

All organisms are made of cells

Two Types of Cells

Prokaryotic Cells:

- Have no membrane covered
 nucleus
- Have no membrane covered organelles
- Have circular DNA
- Are bacteria



Eukaryotic Cells:

- Have a nucleus
- Have a membrane covered organelles
- Have linear DNA
- Are all other cells



Organelles

are structures that enable the cell to live, grow and reproduce.

Cell Membrane

- Outer layer of cell
- Allows nutrients into the cell and wastes outside of the cell

Cytoplasm a jelly-like fluid contained in the cell that holds the organelles.





The Nucleus

The control center of the cell Contains the Cell's DNA

Mitochondria

- Power center of cell
- Provides the energy the cell needs to move, divide, etc.

Endoplasmic Reticulum Transportation system of cell Rough ER- ribosome's attached Smooth ER- no ribosome's



Ribosomes

Ribosomes

Site where proteins are made

- Golgi Complex
- Packaging house of cell



Packages, processes, and ships out the stuff the cell makes

- Lysosomes
- Digests food particles and cell parts
- Protects cell by digesting foreign invaders



CARBOHYDRATES



Carbohydrates

Polyhydroxy aldehydes or ketones or substances that yield these compounds on hydrolysis

Empirical formula: (CH2O)n

Function of Carbohydrates in Cells

- ✓ Major source of energy for the cell
- ✓ Immediate energy in the form of GLUCOSE
- ✓ Reserve energy in the form of GLYCOGEN

Classification

- Monosaccharide
- Oligosaccharide
- Polysaccharide

Monosaccharides

aldehydes or ketones that can't easily be further hydrolyzed "Simple sugars"

Number of carbons	<u>Name</u>	<u>Example</u>
3	Trioses	Glyceraldehyde
4	Tetroses	Erythrose
5	Pentoses	Ribose
6	Hexoses	Glucose, Fructose

Aldoses and ketoses



Aldose





Disaccharides

- Composed of 2 monosaccharides
- Glucose + fructose = sucrose
- Table sugar

Glucose + galactose = lactose

• The primary sugar in milk

Glucose + glucose = Maltose



Oligosaccharides

These are compound sugars that yield **2 to 10 molecules of the same or different monosaccharides** on hydrolysis.

Polysaccharides

- Containing 10 or more monosaccharide units attached together
- Long chains of glucose units

Types of Polysaccharides ≻<u>Starch</u>

- The major digestible polysaccharide in our diet.
- The storage form of carbohydrate in plants.

Two types of plant starch:

1.Amylose

2.Amylopectin



Amylose: is in the form of **straight chain** linked together with **a- 1-4**, linkages glucose.

Amylopectins: It contain beside **straight chain** several **branched chains**, **a**-1-4 and **a**-1-6 linkage, contains glucose molecules.

Cellulose

- form cell walls in plant cells
 - also called fiber
 - indigestible by humans
 - -β(1-4) linkages between
 - glucose monomers



Glycogen

The storage form of glucose in the body.

Stored in the liver and muscles.

Chains of glucose units linked by α -1,4 bond and α -1,6 branches

