Organic Molecules

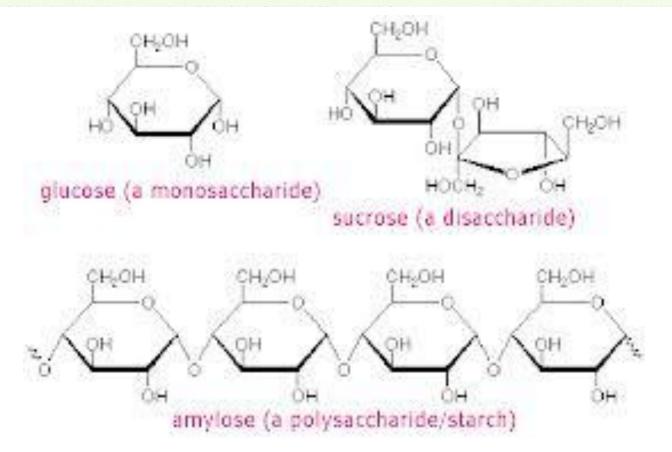
- All biological molecules fall into one of four categories
 - Carbohydrates
 - Lipids
 - Proteins
 - Nucleic Acids

The table in your note packet is not really big enough for all the information on the following slides to be written. You have a choice:

- 1. Create your own, larger table and staple it to your note packet
- 2. Write really small.

Table 3-2	The Princi	pal Biolo	gical Molecules
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Class of Molecule	Principal Subtypes	Example	Function
Carbohydrate: Usually contains carbon, oxygen, and hydrogen, in the approximate	Monosaccharide: Simple sugar with the formula ${\sf C_6H_{12}O_6}$	Glucose	Important energy source for cells; subunit of polysaccharides
formula (CH ₂ O) <i>n</i>	Disaccharide: Two monosaccharides bonded together	Fructose	Energy-storage molecule in fruits and honey
		Sucrose	Principal sugar transported throughout bodies of land plants
	Polysaccharide: Many	Starch	Energy storage in plants
	monosaccharides (usually	Glycogen	Energy storage in animals
	glucose) bonded together	Cellulose	Structural material in plants



Lipid: Contains high propor of carbon and hydrogen; usu nonpolar and insoluble in wa	ally

Triglyceride: Three fatty acids	
bonded to glycerol	
Wax: Variable numbers of	
fatty acids bonded to	

long-chain alcohol Phospholipid: Polar

phosphate group and two fatty acids bonded to glycerol

Steroid: Four fused rings of carbon atoms with functional groups attached



Waxes in plant cuticle

Phosphatidylcholine

Cholesterol

Energy storage in animals, some plants

Waterproof covering on leaves and stems of land plants

Component of cell membranes

Common component of membranes of eukaryotic cells; precursor for other steroids such as testosterone, bile salts





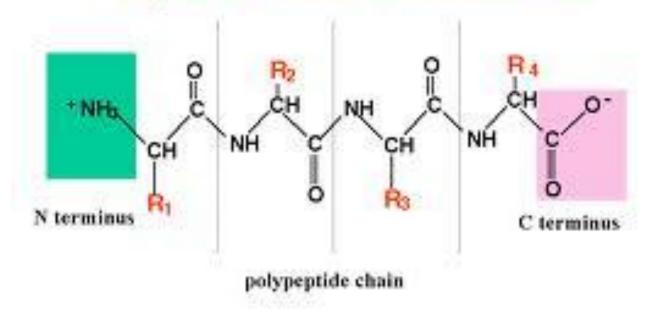


Phospholipid

Table 3.	2 The	Princip	al Biolog	rical Mo	lecules
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Class of Molecule	Principal Subtypes	Example	Function
Protein: Chains of amino acids; contains carbon, hydrogen, oxygen, nitrogen, and sulfur	Peptide: Short chain of amino acids	Keratin Silk	Helical protein, principal component of hair Beta-pleated sheet protein produced by silk moths and spiders
	Polypeptide: Long chain of amino acids; also called "protein"	Hemoglobin	Globular protein composed of four subunit peptides; transport of oxygen in vertebrate blood

Peptide = chain of amino acids



Nucleic acid: Made of nucleotide subunits containing carbon, hydrogen oxygen, nitrogen, and phosphorus. May consist of a single nucleotide or long chain of nucleotides.

Long-chain nucleic acids: polymer of nucleotide subunits

Single nucleotides

Deoxyribonucleic acid (DNA)

Ribonucleic acid (RNA)

Adenosine triphosphate (ATP)

Cyclic adenosine monophosphate (cyclic AMP)

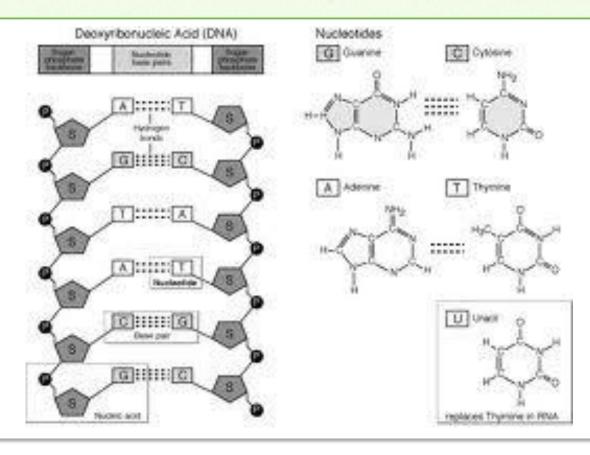
Genetic material of all living cells

Genetic material of some viruses; in cells, essential in transfer of genetic information from DNA to protein

Principal short-term energy carrier molecule

in cells

Intracellular messenger





The big idea...

 Can you list the 4 major categories of biological molecules?

 Can you recognize the major molecular structures of each class of biological molecule?