

Organic Molecules

The 4 Main Macromolecules aka Organic Molecules	Carbohydrates
	Lipids
	Proteins
	Nucleic Acid

Dehydration Synthesis

Video: http://youtu.be/_p_ihfeyirg

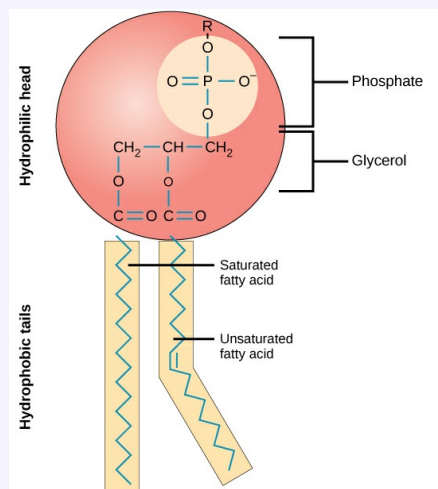
Enzyme (PN) comes and forces the covalent bond to break--> bond breaks and water is formed

Hydrolysis

Video: http://youtu.be/_p_ihfeyirg

-lysis = break
this is an enzyme catalyzed reaction

Phospholipids



Amphipathic: both water loving (head) and hating (tails)

Most often found in the plasma (cell membrane)

Mono, Di, and Poly mers

Monomers	Dimers	Polymers
one subunit	2 subunits of monomers connected by a covalent bond	a chain of 3 or more monomers connected by a double bond
0	0---0	0---0---0---0---0

Polymers

False Polymers	True Polymers
Heteropolymer	Homopolymers
different monomers are attached in a chain	same monomer gets repeated in a chain
0---X---Y---0---X---0	0---0---0---0---0
Lipids	Proteins(PN), Carbs, Nucleic Acid

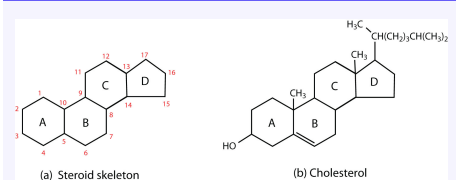
Lipids

Do not form polymers	Fat	Phospholipid	Steroid
little to no affinity to water, hydrophobic	1) Glycerol 2) fatty acid	1) Glycerol 2) fatty acid 3) phosphate	4 or more fused carbon rings
Functional Group: Carboxyl Covalent bond = ester linkage			

Fatty Acid

Fat loses OH- on the Carboxyl bc =O	Glycerol loses H+ bonds to the Carboxyl	Unsaturated Fatty Acid	Saturated Fatty Acid
H2O Produced	H2O Produced	0---\/- --\/-	0-----
		kinked chain = double bond	no kinks = no double bond

Steroids



ONLY STEROIDS ARE FUSED RINGS

Carbohydrates

Polymer: Polysaccharide	Covalent bonds in carbs	Functional Group: Carboxyl C=O
Dimer: Disaccharide	Alfa A: \o/ Glycosidic	C=O at beginning= Aldose
Monomer: Monosaccharide	Beta B: /o\ Glycosidic	C=O in middle= Ketose

Monosaccharides

3-6 Carbons	CH2O
C3H6O3	Triose
C5H10O5	Pentose

Dissachrides



When bonding together:
Glucose will always lose OH-
Fructose will always lose H+

The anomeric carbon is the C attached to OH- and O

Polysaccharides

Cellulose	Chitin
a component of tough cell wall (not digestible)	Forms the exoskeleton of arthropods, makes strong flexible surgical suture
$(C_8H_{13}O_5N)_n$	

Proteins(PN) (cont)

Storage: store amino acids, egg whites, protein in milk

Transport: movement of other substances, hemoglobin

Hormonal: coordination of organism activity; insulin

Receptor: response of cell to chemical stimuli; receptors in nerve cell membrane

Contractile and Motor: movement; actin & myosin in muscles; motor proteins in cilia and flagella

Defense: protection against disease; antibodies that fight bacteria viruses

encompasses 50% of the dry mass of most all cells

Proteins(PN)

Function:	Very	Examples:	Examples:
structure,	complex		
storage,	3D		
transport,	structures		
cellular			
communication,			
movement,			
defense			
against			
foreign			
substances			

One	Several	Enzymes:	Structural:
mistake at the PN level --> genetic mutation --> death	chains of polypeptides attached	digestive; selective acceleration of chemical reactions	support; silk fibers, collagen, keratin, horns etc

