

Organic Molecules

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

Dehydration Synthesis

Video: http://youtu.be/_p_ihfeyirg

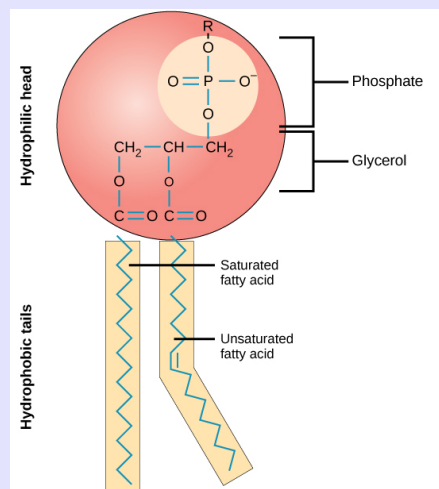
Enzyme (PN) comes and forces the covalent bond to break--> bond breaks and water is formed

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 different monomers are attached in a chain	Homopolymers same monomer gets repeated in a chain
0---X---Y---0---X---0	0---0---0---0---0

Lipids	Proteins(PN), Carbs, Nucleic Acid
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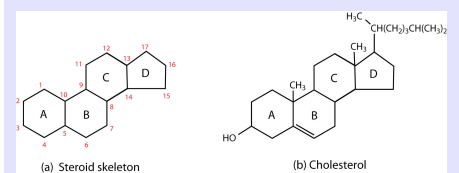
Lipids

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:	Covalent bonds in carbs	Functional Group: Carboxyl C=O
Polysaccharide	Alfa A: \o/ Glycosidic	C=O at beginning= Aldose
Dimer: Disaccharide	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 ₈ H ₁₃ O ₅ N) _n	

Proteins(PN)

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

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

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