

# Cheatography

## Biology Chapter 5 Cheat Sheet

| Organic Molecules   |                | Mono, Di, and Polymers                                   |   |  | Fatty Acid                                    |                                   |                         |                                |                           |
|---|----------------|--|---|--|---|-----------------------------------|-------------------------|--------------------------------|---------------------------|
| The 4 Main Macromolecules aka Organic Molecules   | Carbohydrates  | Monomers   | Dimers  | Polymers   | Fat loses OH- on the Carboxyl bc =O           | Glycerol loses H+ to the Carboxyl | Unsaturated Fatty Acid  | Saturated Fatty Acid           |                           |
|   | Lipids         | one subunit  | 2 subunits of monomers connected by a covalent bond | a chain of 3 or more monomers connected by a double bond | H <sub>2</sub> O Produced                     | H <sub>2</sub> O Produced         | 0---/\- --/\---         | 0-----                         |                           |
|   | Proteins       |  |   |  |   |                                   |                         |                                |                           |
|   | Nucleic Acid   | 0  | 0---0   | 0---0---0---0  |   |                                   |                         | kinked chain = no double bond  | no kinks = no double bond |
| Dehydration Synthesis   |                | Polymers   |   |  | Steroids                                      |                                   |                         |                                |                           |
| Video: <a href="http://youtu.be/_p_ihfeyirg">http://youtu.be/_p_ihfeyirg</a>  |                | False Polymers   | True Polymers                                       | Heteropolymer  | Homopolymers                                  |                                   |                         |                                |                           |
| Enzyme (PN) comes and forces the covalent bond to break--> bond breaks and water is formed  |                | 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                             |                                   |                         |                                |                           |
| Hydrolysis  |                | Lipids   | Proteins(PN), Carbs, Nucleic Acid                   |  |   |                                   |                         |                                |                           |
| Video: <a href="http://youtu.be/_p_ihfeyirg">http://youtu.be/_p_ihfeyirg</a>  | -lysis = break |  |   |  |   |                                   |                         |                                |                           |
| this is an enzyme catalyzed reaction  |                | Lipids   |   |  |   |                                   |                         | ONLY STEROIDS ARE FUSED RINGS  |                           |
| Phospholipids   |                | Do not form polymers                                     | Fat   | Phospholipid   | Steroid                                       | Carbohydrates                     |                         |                                |                           |
| <p>Hydrophilic head</p> <p>Hydrophobic tails</p> <p>Phosphate</p> <p>Glycerol</p> <p>Saturated fatty acid</p> <p>Unsaturated fatty acid</p> |                | 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                  | 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\ Glycosidid  | C=O in middle=Ketose           |                           |
| Amphipathic: both water loving (head) and hating (tails)  |                | Functional Group: Carboxyl Covalent bond = ester linkage |   |  | Monosaccharides                               |                                   |                         |                                |                           |
| Most often found in the plasma(cell membrane)   |                |  |   |  | 3-6 Carbons                                   | CH <sub>2</sub> O                 |                         |                                |                           |
|   |                |  |   |  | C <sub>3</sub> H <sub>6</sub> O <sub>3</sub>  | Triose                            |                         |                                |                           |
|   |                |  |   |  | C <sub>5</sub> H <sub>10</sub> O <sub>5</sub> | Pentose                           |                         |                                |                           |

By **jkreska2**  
[cheatography.com/jkreska2/](http://cheatography.com/jkreska2/)

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by jkreska2 via cheatography.com/44869/cs/13238/

### 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

### 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

Defense: protection against disease; antibodies that fight bacteria viruses

encompasses 50% of the dry mass of most all cells

### Polysaccharides

Cellulose      Chitin

a component of tough cell wall (not digestible)

Forms the exoskeleton of anthropods, makes strong flexible surgical suture

(C<sub>6</sub>H<sub>10</sub>O<sub>5</sub>N)<sub>n</sub>

### Proteins(PN)

Function: structure, storage, transport, cellular communication, movement, defense against foreign substances

Very complex 3D structures

One mistake at the PN level --> genetic mutation --> death

Several chains of polypeptides attached

Enzymes: digestive; selective acceleration of chemical reactions

Structural: support; silk fibers, collagen, keratin, horns etc



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