

Source: [KBiologyMasterIndex](#)

1 | Bio-Molecules Quiz Review

1.1 | Paul's Review Sheet

... is here

1.1.1 | Carbohydrates

Use appearance size, and presence of functional groups to distinguish between the major classes of biomolecules we discussed (carbohydrate, lipid, proteins) and the subclasses within each

- Set 1, carbs. See Luke De's video + [KBhBIO101Carbs](#)
 - *Glucose vs. fructose* — both monosaccharides, one is a 6-carbon ring and one is a 5-carbon ring
 - *Mono vs. di. vs. polysaccharide* — carbohydrates made out of a single, double, and multiple monomer (single-unit) carbohydrates
 - *Starch vs. glycogen vs. cellulose* — lots of alpha glucose in less branches, lots of alpha glucose in more branches, lots of beta glucose in organized lattice respectively.
 - Starch — plant food reserve
 - Glycogen — animal energy reserve
 - Cellulose — cell wall in plants
- Set 2, lipids. See Luke De's video + [KBhBIO101Lipids](#)
 - *Triglyceride vs. fatty acid vs. phospholipid* see [KBhBIO101StructuresofCarbs](#)
 - Glycerol => a fatty acid
 - Triglyceride => three of 'em above
 - Phospholipid => two fatty acid + phosphate head
 - *Saturated vs unsaturated fatty acids* see also [KBhBIO101StructuresofCarbs](#)
 - Saturated Fats => no double bonds in the carbon chain of fatty acids — think! butter
 - Unsaturated Fats => double bonds in the carbon chain of fatty acids — think! olive oil
- Identify functional groups
 - Amino acid groups — see [KBhBIO101AminoAcids](#)
 - carboxyl — $\text{O}=\text{C}-\text{R}-\text{OH}$
 - carboxylic acid — $\text{H}-\text{O}-\text{C}=\text{O}$ (left side of backbone)
 - carbonyl — $\text{C}=\text{O}$ — part of carboxyl
 - amide — $\text{RC}(=\text{O})\text{NR}'\text{R}''$ (frequently shown in side chains of amino acids — see Amine)
 - amino/amine — H_3N^+ (right side of backbone)
 - hydroxyl — OH group. Need I say more?
 - ester — take a carboxylic acid and replace the hydrogen with a R-O group #ASK
 - ether — R-O-R structure. Commonly shown as an alcohol group (H-O-C) as part of the carboxyl
- Monomers vs Polymers
 - Monomer — single molecule (such as a monosaccharide) that could be chained together to make polymers
 - Polymers — complex molecules built from monomers
 - Building polymers — dehydration reaction — taking out

1.2 | Helpful review items

Bonding in organic compounds, a review.

Common nonpolar bonds

Carbon-carbon
Carbon-hydrogen
Carbon-sulfur

Common dipole interactions

Carbon-nitrogen $\delta^+ - \delta^-$ Carbon-oxygen $\delta^+ - \delta^-$
Nitrogen-oxygen $\delta^+ - \delta^-$ Hydrogen-oxygen $\delta^+ - \delta^-$

Common ionic interactions

they come from acid-base interactions.

However, sometimes they are permanent. Look at the amino acid chart for those.

Why hydrogen bonding is excellent

Hydrogen bonding allows stronger dipole-dipole bonds than dipole-dipole bonds. They are still good ol covalent bonds.

These bonds basically combines Hydrogen w/ the most electronegative atoms.



Reading a line-angle representation.



In this type of representations, start with a line. End the line at every carbon.



Now, it is assumed that carbon is not going to just be happy with $\text{C}-\text{C}-\text{C}-\text{C}$.



So, we still the missing orbitals with hydrogen.

$\text{C}-\text{C}-\text{C}-\text{C}$ ← need 3
↑ need 2
↑ need 3

Figure 1: Screen Shot 2020-10-09 at 11:58:55 AM.png