

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 monosacharrides, 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. phosophilid* 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/carboxylic acid —  $\text{H-O-C=O}$  (left side of backbone)
    - carbonyl —  $\text{C=O}$  — part of carboxyl
    - amide —  $\text{RC(=O)NR'R''}$  (frequently shown in side chains of amino acids — see Amine)
    - amino/amine —  $\text{H}_3\text{N}^+$  (right side of backbone)
  - ester
  - ether
  - hydroxyl



## 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

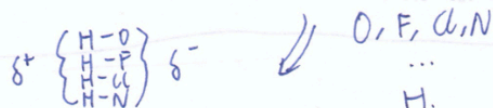
they come from acid-base interactions.

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.

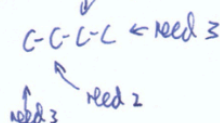


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