Source: [KBBiologyMasterIndex]

1 | Bio-Molecules Quiz Review

1.1 | Paul's Review Sheet

… is here

And Jack's raw answers: [KBhBIO201BioMoleculesRAW]

1.2 | Cell Structures

- Organizing organelles based on membranes #ASK
  - Used as a gauge to sort the evolutional history of cells
  - Membranous organelles — possess own plasma => regulates own macromolecure consumption, hormones, etc. Perhaps original prokarotic cells
    - Double membranes, evolved later
      - Endoplasmic reticulum => forms the network of transferring proteins and other elements
      - Golgi body/Gioli apparatus => packs, sorts, and modifies proteins and other elements throughout the cell
    - Double membranes, prokarotic orginially
      - Mitochrondria => store ATP and extract energy from ATP
      - Chloroplasts => Does photosynthesis
    - Single membranes => probably originally fragments of prokaryotic cells
      - Vesticles
      - Lysomoes => breaking stuff down and garbage dumps
      - Vacuoles => storing water, nutrients, waste
  - Non-membranous organelles — does not posess own plasma => mostly part of the cytoskeleton of a cell
    - Ribosomes => protein synthesizer in the cell
    - Centrosome => forms flangella, cilla, and handles cells divisions
    - Plastids => creates colours displayed in the chromoplasts
- Cell Components. Basicall all of these exist only in Eukareotic cells
  - flagella and cilia
    - Flagella => a bacteria's tail — allow them to move and also act as an sensory organ. longer than a cilla, and moves in sinosoidial pattern.
    - Cilium => a cell's "hair" — provides sensory and communications functions. Motil cilla could move about to "grab" things, and non-motile cilla can't move. more abundant that the flagella, and moves in circular pattern if they do move, and moves in circular pattern if they do move
  - Ribosomes and Golgi apparatus
    - Ribosomes => synthesizes proteins
    - Golgi apparatus => packs, modifying, and moving proteins

1.3 | Plasma Membrane Structure + transport

- Lipid structure and substructures: [KBhBIO101Lipids]

- Functions of cell membrane
    - Phosophilid structures [KBhBIO101StructuresOfLipids]
    - Transmembrane proteins KbhBIO101CellTransport
    - Hydrophobic + hydrophillic parts of a phosophilid [KBhBIO101StructuresOfLipids] + [KBhBIO101FluidMosaic]
- Passive + active transport KbhBIO101CellTransport
- Cell transport process
    - Simple diffusion => things just spread out from high concentration to low concentrations
    - Passive diffusion => non-polar molecules needed "fall in" through the phosolipid bi-layer
    - Facilitated diffusion => specific polar molecules go along the gradient to get into the cell through transporter proteins. Osmosis is the facilitated diffusion, just of water + auquaporin.
    - Phagocytosis => take a piece of the membrane with you to form a vesticle to introduce large solid elements, recycling the membrane after done — "cell eating"
    - Pinocytosis => take a piece of the membrane with you to form a vesticle to introduce large area of the "outside" in — fluid and solid and all, recycling the membrane after done — "cell drinking"
    - Endocytosis => Phagocytosis + Pinocytosis
    - Extocytosis => opposite of endocytosis
- Defining…
    - Isotonic => inside and outside have the same level of "osmolarity": probablility for osmosis to happen through a semipermiable membrane
    - Hypertonic => inside has less osmolarity than the outside: water/other elems will flow out of the cell
    - Hypotonic => outside has less osmolarity than the inside: water/other elems will flow into the cell

1.4 | Proteins Structures and Function

- Overall structure, monomers/building blocks, functions, and examples of proteins => [KBhBIO101Proteins]
- "peptide" => a chain of amino-acids
- Polymerization via dehydration
    - Take two amino acids, take the H-O out of the alcahol, take the H out of the Amine. Fill the hole with the other one
- Protein structure
    - Primary structure, secondary structure => [KBhBIO101Proteins]
    - Amino acids, N & C terminus => [KBhBIO101AminoAcids]. N terminus (Amine), C terminus (Carbolixic.)
    - Secondary structure — H bonds between H-O, H-N
    - Tertiary structure => see the [KBhBIO101Proteins] articles
- The functions of proteins are varied because the primary sequence can be varied, effectively building any shape protein to do its specific function
- Form = function is the idea that the shape or form a protein takes through the combination of primary, secondary, tertiary, or quaternary structure determines how it will then function. Any changes to the structure will have some impact on its function and the more the structure is affected the more the function is likely to impacted
- Functions => defense, movement, structure, transport, cell to cell signaling, etc.

1.5 | Cell Structure

- Enzymes? [KBhBIO101Enzymes]

OK, so. Apparently Paul just answered the rest of his questions.

And I quote

”””

Enzymes are catalysts. They speed reaction rates but do not affect the change in free energy of the reaction (the difference in potential energy between reactants and products).

- Activation energy is the amount of kinetic energy required to reach the transition state of a reaction.
- Enzymes speed up a reaction by lowering the activation energy, often with the help of cofactors or coenzymes.
- **Enzymes lower the activation energy by some combination of…**
    - Orienting the reactions substrate(s) to promote more effective collisions (and therefore reactions
    - Stressing or straining bonds to temporarily and/or slightly lower the strength of attraction to allow the bond to break more easily
    - Involving amino acid R-groups or sidechains in creating the transition state between reactants and products

Enzymes have active sites that bring substrates together and may change shape to stabilize the transition state; known as Induced Fit upon binding active site and slight change in enzyme shape.

Most enzymes are proteins, and thus their activity can be directly influenced by modifications or environmental factors, such as temperature and pH, that alter their three-dimensional structure.

Enzyme activity may be regulated/inhibited by molecules that compete with substrates to occupy the active site (competitive inhibitor) or alter enzyme shape so that substrates become unable to enter the active site (non-competitive inhibitor).

”””

1.6 | **Helpful review items**

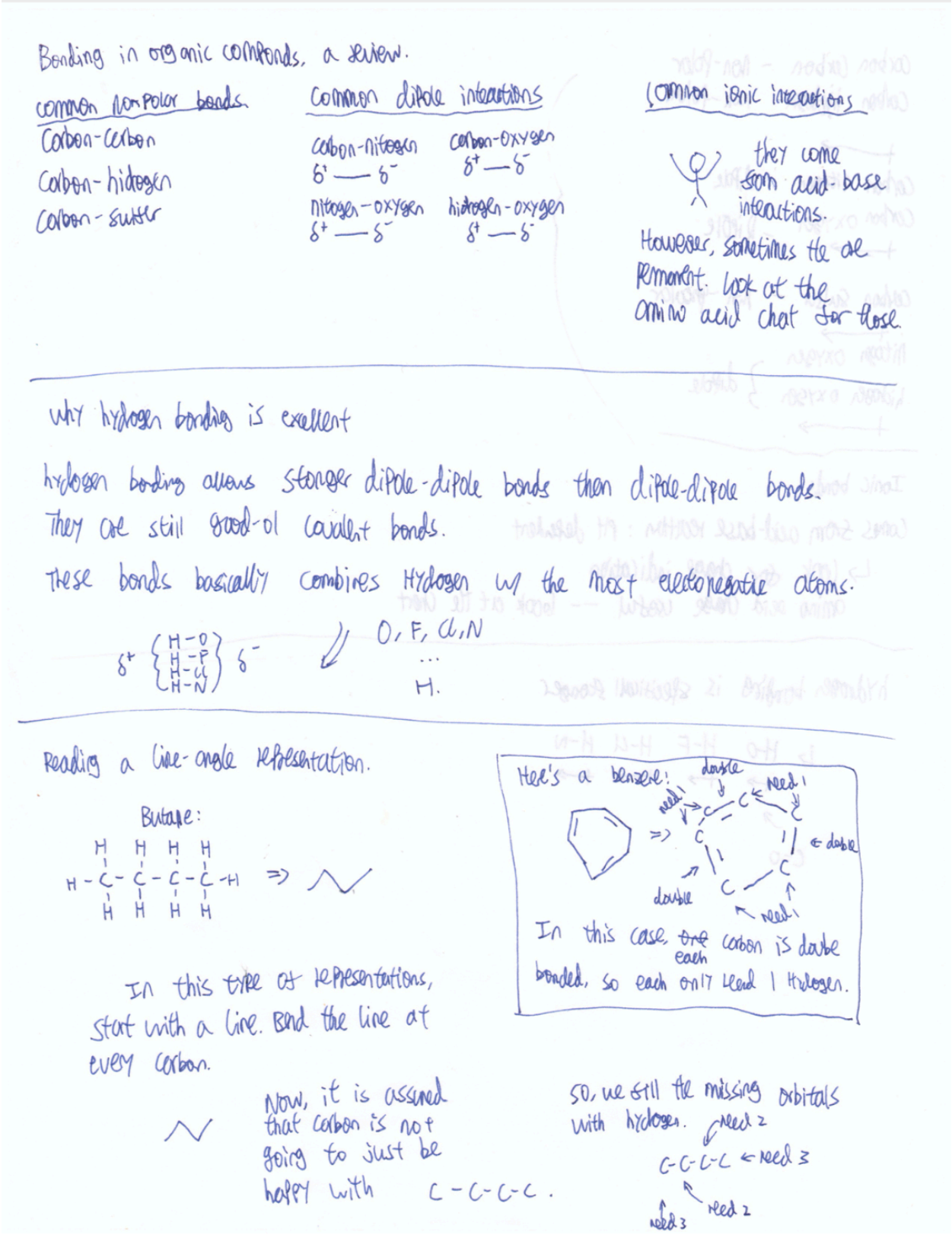

Figure 1: Screen Shot 2020-10-09 at 11.58.55 AM.png

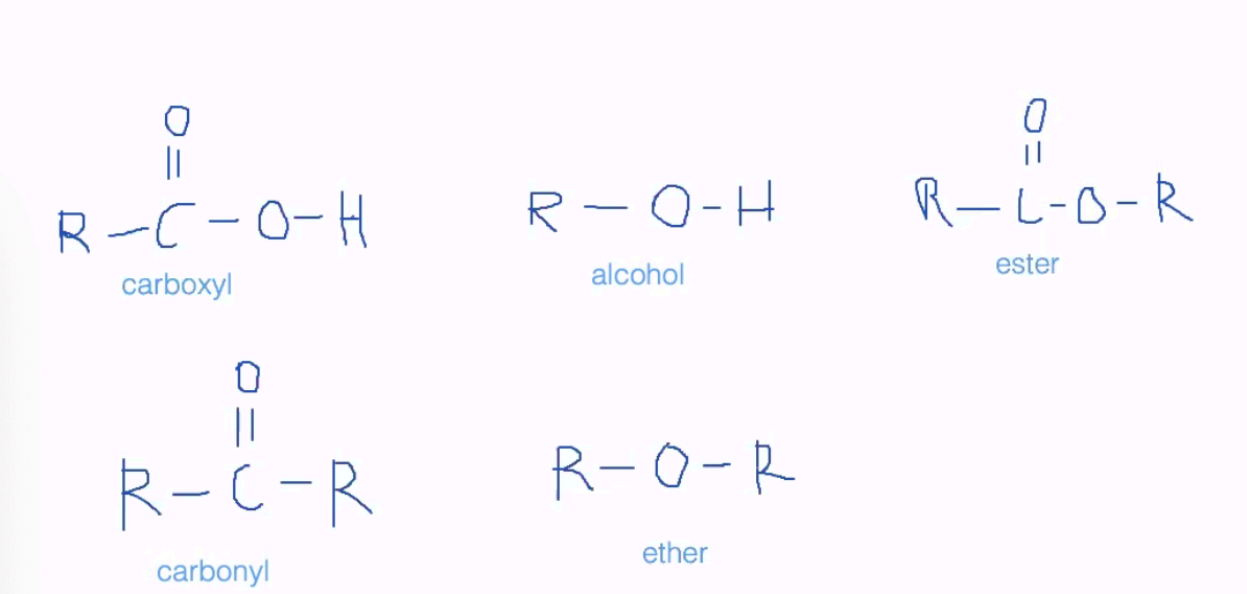

Figure 2: Screen Shot 2020-10-12 at 2.34.16 PM.png