

Clarification of the Relationship between Cellular Chemistry and A&PI

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Cellular Chemistry is not currently a prerequisite for A&P, and the student can pass A&P without first taking chemistry. However, some of the material presented in Cellular Chemistry is invaluable to understanding concepts in A&PI, and the student should take the extra time to read the following sections from chapters 2 & 3. Those marked by an asterix (*) should be read within the first 2 weeks. Failure to understand these concepts will result in a lowered ability in A&P, and these concepts/definitions will appear on Exam I:

Chapter 2. *Electrons & Energy Levels, *Chemical Bonds (ionic & covalent), **States of Matter** and their properties, Chemical Reactions, ***Water and it's Properties**, ***Solute Concentrations**, ***Carbohydrates**, ***Lipids**, ***Proteins**, **Nucleic Acids** and ***ATP**.

Chapter 3. ***Plasma Membranes**, ***Diffusion**, **Osmosis**, Vesicular Transport, ***Mitochondria**, Cilia, Microvilli, Secretory Vesicles, The Nucleus (up to Translation), The Cell Life Cycle (up to cytokinesis), Protein Synthesis .

Know especially, for they are likely to be on Exam #1, examples of the difference types of energy, potential vs. kinetic energy, the factors affecting diffusion, the role of a catalyst (and enzymes), the important elements & the molecules important to life, what is a salt (and their properties), know the atomic symbols for the common ions, define hypertonic versus hypotonic, define hydrophobic versus hydrophilic, cations versus anions, be able to define what an organic molecule is, give all the characteristics of acids & bases (including in terms of H⁺ and OH⁻), be able to use the pH scale (what is high pH? What does a pH of 6 mean? What is neutrality?), what is a buffer, what are the building block molecules, what are the macromolecules, what are mono- and di- saccharides, what is glucose & it's properties, what is a fatty acid, characteristics of saturated/non-saturated lipids (and where you find them), poly- vs mono-unsaturated fats, what is a phospholipid, what is a triglyceride, what's osmosis, what is DNA, what is nucleic acid, what is a nucleotide, define polarity, define voltage, define exocytosis, define endocytosis, define phagocytosis, define pinocytosis, know what a vesicle is, know which types of transmembraneous transport require energy, what is a steroid hormone, what are cilia and microvilli, what is a flagella, what is AMP, what is a hydrolytic enzyme, how does dehydration synthesis occur, what is cytoplasm made of, what is cytosol, what is in the nucleus, how is the nucleus structured, how do phospholipids form the bilayer. etc, etc, etc.....

Know the functions of the following organelles: RER, SER, mitochondria, cytoskeleton, centrioles, centrosomes, ribosomes, nuclear envelope, nuclear pores, golgi apparatus, lysosomes, peroxisomes, secretory vesicles, nucleoli, free ribosomes, bound ribosomes, etc.....

Know the role in the plasma membrane of the following: phospholipid, tranmembraneous protein channels, integral proteins, glycoproteins, proteoglycans, glycocalyx, cholesterol.

Define: metabolism, catabolism, anabolism, & cellular respiration, covalent, ionic, electrolyte, acid, base, alkaline, hydrolysis, dehydration synthesis, osmosis, concentration gradient, hypertonic, hypotonic, hydrophobic, solute, solvent, solution, osmolarity, OSM, matter, energy, light, electricity, current, voltage, polarity, chemical bond, double bond, electromagnetic force, anion, cation, intramembraneous system, anaerobic, aerobic, cellualr respiration, carbon dioxide, ammonium ion, log scale, synthetic reaction, decomposition reaction, exchange reaction, lipid, glycerol, saturated, carbohydrate, protein, polymer, primary structure, secondary structure, alpha helix, terciary structure, beta pleated sheet, enzyme, catalyst, hormone, isotonic, hypertonic, hypotonic, mitochondria, ATP.

This is not an inclusive list, and additional sections may be added.