

BMD 330: Human Physiology
Chapter 3 Objectives

Cell Metabolism

1. Define metabolism and distinguish between catabolic and anabolic reactions.
2. Define metabolic pathways.
3. Describe the different types of metabolic reactions.
 - a. Hydrolysis/Condensation
 - b. Phosphorylation/Dephosphorylation
 - c. Oxidation-Reduction
4. Explain the concept of energy change in a reaction.
 - a. Describe energy of reactants and products
 - b. Describe the relationship of energy change to the direction of a reaction
5. Define the Law of Mass Action.
6. Define activation energy and describe its influence on the rates of reactions.
7. Describe factors that affect reaction rates.
 - a. Reactant and product concentration
 - b. Temperature
 - c. Height of the activation energy barrier
8. Describe the mechanism of enzyme action.
 - a. Lock-and-key model
 - b. Induced fit model
9. Describe factors affecting the rate of enzyme-catalyzed reactions.
 - a. Catalytic rate
 - b. Enzyme concentration
 - c. Substrate concentration
 - d. Enzyme affinity
 - e. Regulation of enzyme activity
 - i. Allosteric regulation
 - b. Covalent regulation
10. Compare the roles of feedback inhibition and feedforward activation.
11. Describe the role of ATP in energy transfer.
12. Describe the events of glycolysis from glucose to pyruvate, concentrating on key steps. Do not memorize enzymes in the pathway or names of intermediates.
13. Describe the major products of the Krebs cycle. Do not memorize enzymes in the pathway or names of intermediates.
14. Describe how ATP is synthesized by oxidative phosphorylation. Explain the chemiosmotic theory.
15. Describe how the body is able to obtain energy from the breakdown of fats, proteins, and glycogen, and how it stores energy by synthesizing these compounds.

