

CSM Biol 260
Study Guide One Fall 2009

1. Define homeostasis. Apply the negative feedback mechanism to a homeostatically regulated variable and draw a concept map or flow chart showing the parts of the mechanism. Give some examples of homeostatically controlled variables in the body. Explain the contents of a bar graph to show that you understand what the data mean. Describe scientific method. Explain the concepts of normal range, setpoint, regulated variable, controlled variable. Draw a positive feedback mechanism, describe what is meant by feed forward, and adaptation.
2. Know your metric units and how to convert between them. Do problems relating to concentrations of solutions or dosage calculations. Explain the concepts of: tonicity, osmolarity, molarity, equivalents, % solutions. Define diffusion and osmosis, and look at factors affecting diffusion. Do problems converting these units. Describe the functions of water in the body, and name the fluid compartments of the body. How much water do our bodies hold? What are some of the factors influencing total body water? What are the mechanisms that regulate water and electrolyte balance? Describe the four types of water disturbances, and include causes. Contrast the components of the fluid intracellularly and extracellularly. Differentiate between polar, nonpolar and charged particles. What are some of the functions of key electrolytes. Discuss acids, bases, and the pH scale. Describe the body's buffer systems. Describe some of the causes of acidosis and alkalosis in the body. How does the body deal with these disruptions? Describe the three mechanisms compensating for acid/base disturbances.
3. Draw and describe the structure of the cell membrane. Explain the role of the membrane in allowing different types of transport: passive and active. Compare and contrast the different types of transport, give examples of each. Explain the difference between a nonliving membrane, such as we used in the Transport Lab, and the living membranes. Predict what will happen when solutions of different concentrations are separated by a living or non-living membrane. Explain how an electrical gradient might be generated across a cell membrane.

4. Describe the other roles of proteins in the membranes of the cells. Describe the different levels of protein structure, and give examples. Identify factors that influence these levels of structure. Describe the importance of these structures for receptors, enzymes, and cell-to-cell interaction. Describe the lock and key mechanism. Answer questions related to digestive enzyme action as seen in Digestion lab from PhysioEx: define terms, list factors affecting enzyme activity, explain tests for various digestive products, explain major events of digestion and absorption in the body.
5. Define and relate terms relating to heredity of genes including: gene, dominant, recessive, incomplete dominance, allele, genotype, phenotype, sex-linked inheritance, autosomal inheritance, Punnet square, heterozygous, homozygous, probabilities. Do genetics problems similar to those in the Heredity lab.
6. Outline the processes of aerobic and anaerobic metabolism, discussing the roles of coenzymes, enzymes, alternate fuels. Show the energy yields from glycolysis, Krebs's and electron transport chain. Define anabolism and catabolism, oxidation and reduction, substrate level and oxidative phosphorylation. Describe how the body processes its fuels in times of fasting and nonfasting. Know the roles of various nutrients in your body. Describe the nutrient mix in a healthy diet. Know the importance of a healthy BMI, % body fat. How many Calories per gram carbs, fats, proteins. How many Calories in a lb. of fat? Do math problems relating to weight loss.
7. Outline the process of gene expression (protein synthesis). How is gene expression regulated. Explain transcription factors, and environmental factors.

The chapters in Marieb include parts of:

Chapter 1, 2, 3, 23, 24, 29