

ExPhys 2003
Powers and Howley
Ch. 3 -- Bioenergetics Study Questions

Note that most of the "detailed material" you will be responsible for that is contained in Ch. 3 is also in the handout class notes. This sheet is intended as an additional guideline to point out important highlights.

1. Know the following terms/names: bioenergetics, metabolism, mitochondria, glucose, glycogen, glycogenolysis, fatty acid, lipid, triglyceride, ATP, ADP, AMP (know the difference between each), phosphocreatine (creatine phosphate), anaerobic, glycolysis, acetyl CoA, lactic and pyruvic acid, lactic de hydrogenase
2. What is the relationship between glucose and glycogen? Where is glycogen found in the body?
3. Are all amino acids equally useful as energy stores? More about this in Ch. 4.
4. What are the two biologically important electron (proton) carrier molecules' initials? These compounds shuttle energy about in the cell. Where do they move it from and to?
5. What does the electron transport chain do? How many ATP molecules are made from ADP and P_i for each pair of electrons that enters this chain "at the top"? "in the middle"?
6. Where in the cell are carbohydrates, fats, and amino acids broken down? What processes are used for each? Which can be used as anaerobic fuels?
7. When we talk about efficiency of aerobic and anaerobic metabolism, what are we talking about? -- *i.e.*, how do we define efficiency in this case?
8. What compounds decrease and increase the catalytic ability of creatine kinase? How about phosphofructokinase? Explain (in both cases) how changes in these compounds helps to keep energy (ATP) availability at the correct level.
9. Be able to discuss the energy sources used in exercises that are sustainable for different time periods. You should be able to do so both for the overall relative sources of ATP used in the exercise and also for when these sources are used.

Please look over the questions at the end of the chapter

Especially useful figures: Fig 3.11, 3.14, 3.15, 3.18 and tables 3.2 and 3.3.