

BERG/STRYER VI STUDY GUIDE

CHAPTER 20

1. Homework problems 9, 11, 12, and the pentose phosphate worksheet.
2. You should be able to write out the **pentose phosphate pathway** (oxidative and non-oxidative branches) with all structures, enzyme names, and cofactors. The PPP functions to provide **NADPH** and **ribose**. You should understand why these products are important and how both branches of the PPP can interact to provide the products which are needed by a cell (modes 1, 2, 3, or 4, Fig. 20.24). In which tissues is the PPP most active? Understand the mechanisms of **Transketolase** and **Transaldolase** (parallel to Pyruvate DH Complex and Aldolase respectively), see pages 581-2.
3. **Glutathione** (p. 586) acts as a "redox" buffer to protect cells against oxidation. You should understand why cells with decreased G6PDH activity are more sensitive to oxidative stress. Why does the drug **pamaquine** cause hemolytic anemia? Also read handout from previous edition about **Wernicke-Korsakoff Syndrome** (weak binding of TPP to Transketolase).
4. [The **Calvin Cycle** is very important in supporting life on Earth. Basically you should understand that it is made up almost entirely of reactions from Gluconeogenesis and the Pentose Phosphate Pathway. We will not be studying it as a pathway *per se*. In photosynthesis the "**Light Reaction**" uses energy from photons to provide the cell with ATP and NADH. The "**Dark Reaction**" – the Calvin Cycle – utilizes these products to form the whole panoply of organic compounds in the cell starting with CO₂. This is pure standard biochemistry, and not dependent on light in any way. It is the light reaction which produces oxygen gas, by removing electrons from water and promoting them to higher energies.]