BERG/STRYER VI STUDY GUIDE

CHAPTER 24

1. Homework 3, 7, 10. We will only cover a few topics in this chapter. You should know what **essential** amino acids are, and know the list presented (685). Understand the discussion of chirality (Fig. 24.4), and know that many amino acids can be formed by simple transamination. Be able to identify the various derivatives of **THF**, and be able to complete the THF worksheet handout (690). The other major cofactor in handling the "one carbon pool" is **SAM** (691-2). Be able to draw the reaction that makes S-adenosylmethionine, know how it is used, and know about **homocysteine** and vascular disease (693).

2. Know the structure of **Glutathione** (ECG, 701, and recall Ch. 20 p. 586) and understand what effects a **selenium** deficient diet would have. Animals have the enzyme **glutathione peroxidase**, a selenoprotein, which plants lack. Know the relationship of the protoporphyrin ring used for heme groups, and the "jaundice" pigment **bilirubin** (704).

CHAPTER 25

1. Homework 11,15. This is another chapter where only a few "highlights" will be covered. You should know the nomenclature in Table 25.1 (710). Know the "map" of the **pyrimidine** ring in Fig 25.2, and of the **purine** ring in Fig 25.5. Many of the major motifs of nitrogen transfer show up in purine synthesis – **aspartate** donation (just like in urea cycle), **glutamine** donation, etc. Know that the synthesis of **Thymidylate** from **dUMP** (Fig 25.13) uses **CH_2-THF** and produces **DHF**. The subsequent reduction by **DHFR** affords a good target for cancer chemotherapy. Blocking DHFR prevents DNA synthesis, which is very important for rapidly dividing cancer cells but less important for most cells in the adult human body. Read about anticancer drugs (722-3) like **methotrexate**.

2. The **Salvage Pathway** is introduced in Fig 25.1, and explained on 714. The "pathway" is basically one step long, using either **adenine phosphoribosyl-transferase** or **Hypoxanthine-guanine phosphoribosyl-transferase** (**HGPRT**) to react purine bases with **PRPP**. Nearly the same process is used in the synthesis of redox cofactors. Once a purine is disconnected from its sugar, it is in danger of gradual oxidation culminating in **uric acid** (see pathway in Fig. 25.17). In such diseases as **gout** or **Lesch-Nyhan Syndrome**, uric acid levels are elevated and damaging crystals form.