CHAPTER 24

1. Homework 9, 15, 18. We will only cover a few topics in this chapter. You should know what essential amino acids are, and know the list presented (711). 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 (Fig 24.10). The other major cofactor in handling the "one carbon pool" is SAM (717). Be able to draw the reaction that makes S-adenosylmethionine, know how it is used, and know about homocysteine and vascular disease (719).

2. Know the structure of Glutathione (ECG, 727, and recall Ch. 20 p. 609) 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 (Fig. 24.31).

CHAPTER 25

1. Homework 18, 24. This is another chapter where only a few "highlights" will be covered. You should know the nomenclature in Table 25.1 (736). 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 CH₂-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 (750) like methotrexate.

2. The Salvage Pathway is introduced in Fig 25.1, and explained on 741. The "pathway" is basically one step long, using either adenine phosphoribosyltransferase 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.