

BERG/STRYER V STUDY GUIDE

CHAPTER 11

1. Homework 1, 3, 9, 12, 13. Know the sugar structures on 297 *except* Arabinose, Lyxose, Altrose, Gulose, Idose, and Talose. Know the structures on 298 *except* Psicose and Tagatose. Be able to draw Sedoheptulose (557). Understand how to convert from linear to ring form (both chemically and intellectually!) (299). Study the whole chapter carefully up to the end of cellulose on page 303. You are not responsible for Glycosaminoglycans etc. (304ff).
2. Be able to **draw** all assigned sugar structures either in **Fischer** or **Haworth** projections. Understand D and L, anomer, epimer, isomer, ketal, acetal, hemiketal, hemiacetal, reducing sugar, alpha and beta anomers, glycosidic linkage, aldose, ketose, and terms on "**Naming Rules**" handout. Sometimes unusual sugar structures show up on tests, for example, draw beta-D-sedoheptulofuranose, or alpha-D-xylopyranose. Understand about "boat and chair" conformers (300). Know how to draw, and name systematically, disaccharides such as **sucrose**, **lactose**, and **maltose** (Fig 11.11). Sucrose is stable because it is not a reducing sugar. Lactose, or milk sugar, is indigestible for adult mammals who/which generally don't have enough lactase. Understand "lactose intolerance" (442). **Starch**, **glycogen**, and **cellulose** are important polysaccharides (303).

CHAPTER 12

1. HOMEWORK – 4, 6, 7, 12. This chapter presents the structures of several membrane lipids. You should be able to draw **Phosphatidates** with the head groups shown on page 323 (Fig 12-5). You should also know the structure of **Sphingosine**, **Sphingomyelin**, and **Cerebroside** (324-5). Know that Archaea have lipids without fatty acids or esters – a diphytanyl ether is shown on 324. Compare phytol in Fig. 19.5 (530). You should be able to draw the **steroid** nucleus or cholesterol (325). Understand that polar lipids form sheet-like assemblies, including the lipid bilayer membranes found around most cells and compartments in cells (Fig 12.11). Membranes also contain roughly 25% to 75% protein, and this fact helps to make the membrane (like our skin) a "sense organ" for the cell. **Receptors** are generally transmembrane proteins, as are transport proteins for taking in food and excreting waste. You should be generally familiar with the list of membrane properties on page 320. The "**Fluid Mosaic Model**" of membrane structure (p. 336) pictures proteins as capable of lateral diffusion, but not generally able to flip-flop or leave the membrane. The degree of fluidity of the lipid phase is determined by the number of unsaturated fatty acids and, in eucaryotes, the amount of cholesterol as well as by the temperature (337). Understand that carbohydrates can be attached to membranes either as **glycolipids** (sphingosine derivatives, 325) or **glycoproteins** (attached to AsN, Ser, or Thr – examine Fig. 12.27 page 334). The oligosaccharides are usually on the **outside** of the membrane. ABO Blood group substances (305) are a good example. Know that prostaglandins come from arachidonic acid (Fig 12.22) and that Aspirin works by interfering with this (Fig. 12.25). In Fig 12.35, the membrane on the *right* is Gram-positive, and the one on the *left* is Gram-negative. Gram-negative bacteria have a "stomach" to digest their food in.