1. Know the general pathway for cholesterol biosynthesis.
   a. All carbons are derived from acetate
   b. Cytosolic
   c. Mechanism
      i. Thiolase:Acetyl-CoA Acetyltransferase: 2 Acetyl-CoA --> Acetoacetyl-CoA + CoASH
      ii. HMG-CoA Synthase: Acetoacetyl-CoA + Acetyl-CoA --> HMG-CoA + CoASH
      iii. HMG-CoA Reductase: HMG-CoA + 2 NADPH --> Mevalonate + 2 NADP+ + CoA
      iv. Mevalonate --> Squalene
      v. Squalene --> Lenosterol
      vi. Lenosterol --> Cholesterol
2. Know the major site of regulation. --> HMG-CoA Reductase
3. Know how HMG-CoA Reductase is regulated.
   a. Long term feedback control of amount of enzyme
      i. Decrease in cholesterol concentration --> release of ER membrane protein
      ii. Sterol Regulatory Element-Binding Protein and SREBP Cleavage Activating Protein bound together on ER membrane
      iii. Sterol levels decline and complex migrate to Golgi
      iv. Two cleavages result in SREBP migrating to nucleus
      v. Transcription of HMG-CoA reductase and LDL receptor gene
      vi. Due to this system, dietary cholesterol control alone does not necessarily work because you just produce more cholesterol
   b. Covalent Modification
      i. Activated by dephosphorylation by PPP
         1) Insulin activates PPP
         2) Glucagon --> PKA --> AMP Kinase --> phosphorylates/inactivates HMG CoA Reductase
      ii. Statins are competitive inhibitors of HMG CoA Reductase