

1. Cholesterol is an important precursor for signaling events involved in cellular communication. Draw the structural formula of cholesterol and name two derivatives having hormonal functions! (4 points)
2. What is glycogen; how it is composed and what are/is the major enzyme(s) contributing to its synthesis which is regulated by insulin? How is this insulin-dependent enzyme regulation working? (4 points)
3. What is the common domain (structural element) in calcium binding proteins? (1 point)
4. What signaling events are caused upon binding of glucagon to its receptor on a liver cell (hepatocyte) and what are the metabolic adaptations/effects in short-term and long-term? (6 points)
5. What feature allows glucose transporters in muscle and fat to be quickly mobilized? (2 points)
6. Describe the molecular mechanism by which Stat3 molecules are activated. (4 points)
7. Many hormones use cyclic nucleotides as mediators. What are the major cyclic nucleotides used? Which enzymes and what class of drugs influence the half-life of these cyclic nucleotides? (3 points)