

## Chapter 12/13 Questions Introduction to metabolism

The book questions are very good do not ignore them.

Chapter 12 - Book study questions: 9 and 10 Book problems 10

Chapter 13 - Book study questions: 2, 3 and 4 Book problems 3, 4, 5 and 10

- 1) Cyclic AMP dependent protein kinase (PKA):
  - a) is activated by binding cAMP to its catalytic subunits.
  - b) hydrolyzes cAMP to 5' AMP.
  - c) has regulatory subunits which bind cAMP.
  - d) Acts as an inhibitor of gene transcription.
  - e) is a single subunit enzyme whose regulatory domain is adjacent to the catalytic domain
  
- 2) Protein kinases:
  - a) transfer a phosphoryl group from one protein to another
  - b) use AMP as a substrate
  - c) (PKC and PKA) Ser, Thr or (PTK) Tyr
  - d) transfer the alpha phosphate of ATP
  - e) are located on the external surface of cells
  
- 3) True/ False: The extracellular portion of Src like kinases are thought to bind growth factors **False**
  
- 4) Which protein kinase is activated by calcium and lipids:
  - a) protein kinase A.
  - b) protein kinase B.
  - c) protein kinase C.
  - d) protein kinase D
  - e) tyrosine protein kinase
  
- 5) An enzyme that inhibits its activity through a pseudo substrate does so by:
  - a) listening to Phil Collin's side B of Susudio.
  - b) binds a look a like substrate to the regulatory domain.
  - c) interacting the pseudo substrate at the catalytic site.
  - d) phosphorylating a different protein and thereby inactivating it.
  
- 6) Protein kinase activation of an enzyme is reversed by what?
  
- 7) What stabilizes activation by protein kinase phosphorylation?
  
- 8) I will most likely ask a question about the various regulatory mechanisms of the protein kinases. Also general info about some of the kinases.

- 9) The allosteric effect of CTP on ATCase is considered
- homotropic activation
  - homotropic inhibition
  - heterotropic activation
  - heterotropic inhibition
- 10) Coupling of an endergonic reaction with ATP hydrolysis:
- accelerates its rate
  - generates an enzyme bound phosphate intermediate
  - shifts the overall equilibrium constant
  - changes the enthalpy of the reactants and products
- 11) Metabolism can be regulated by
- altering the transcription of some enzymes
  - changing the concentration of allosteric modifiers
  - altering the transport of substrate into a cell
  - all of the above
  - none of the above
- 12) Write out the pathway/mechanism for the covalent modification of a protein by phosphorylation.
- 13) Describe activation and the regulation of protein kinase C. Include the roles of domains, activators, substrate specificity isozymes.
- 14) The enzyme responsible for conversion of GTP to ATP is called:
- nucleoside diphosphate kinase
  - phosphoenol pyruvate carboxykinase
  - succinate thiokinase
  - GTP converting factor
  - ATP reversesase
- 15) The standard state free energy  $G^{\circ}$  for the MDH reaction is +7.1 kcal/mol, yet the cycle can continue with a free energy of -7.7 kcal/mol. How is this possible?