

* 所有考題務必在答案卷上作答。 Cell Biology 1991 * 在問題卷上作答者無效

Part I. Multiple Choices: (more than one answer may be correct) (15%)

1. Many transformed cells release growth factors that subsequently stimulate the same cells from which they were released. This type of signal pathway is termed
 - (a) autocrine
 - (b) paracrine
 - (c) endocrine
 - (d) mesocrine
 - (e) exocrine
2. Hormones whose receptors are located in the nucleus of the cell include
 - (a) progesterone
 - (b) nerve growth factor
 - (c) thyroxine
 - (d) insulin
 - (e) follicle-stimulating hormone
3. The response to Ca^{+2} ions acting as a second messenger include
 - (a) contraction of skeletal muscle
 - (b) activation of cAMP-dependent phosphodiesterase
 - (c) breakdown of glycogen to glucose-1-phosphate
 - (d) exocytosis of secretory vesicles
 - (e) downregulation of LDL receptors
4. Protein kinase C is activated by
 - (a) magnesium ions
 - (b) calmodulin
 - (c) calicium ion
 - (d) diacylglycerol
 - (e) zinc ion
5. Cholera toxin increases cAMP levels by
 - (a) inhibiting cAMP phosphodiesterase
 - (b) binding to G_s protein
 - (c) binding to G_i protein
 - (d) binding to adenylyl cyclase
 - (e) binding to hormone
6. Sigma factors
 - (a) are required for RNA polymerase to bind to DNA
 - (b) can be produced in response to environmental stress
 - (c) is important in eucaryotic transcription
 - (d) mediate recognition of promoters
 - (e) are transiently associated with RNA polymerase
7. Heterochromatin
 - (a) consists only of inactive genes
 - (b) can contain repetitive DNA
 - (c) is visible during interphase
 - (d) can be activated by DNA methylation
 - (e) contains no chromosomal protein

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Part II.

8. What is osmosis, and what causes its occurrence? (4%)
9. Define plant tropism. (4%)
10. In anaerobic routes of glucose breakdown, further conversion of puruvate do not yield any more usable energy. What, then, is the advantage of the conversion. (4%)

11. What is scientific methods? (5%)
12. What are some of the functions of blood? (5%)
13. Does the living state violate the second law of thermodynamics? In other words, how does the world of living things maintain a high degree of organization, even though there is a universal trend toward disorganization. (6%)
14. Which hormones have profound influence over male reproductive function? can you diagram how feedback mechanisms link the hypothalamus, anterior pituitary, and interstitial cells in controlling this functioning? (6%)
15. Describe the organization of DNA in eucaryotic nucleus. (6%)
16. Describe the fluid mosaic model of plasma membranes. What makes the membrane fluid? What parts constitute the mosaic? (8%)
17. There are two general classes of hormones: steroid and polypeptide. How is each thought to act on a target cell? (8%)
18. Compare the mRNA transcription in procaroyotes and that in eucaryotes. (note: focus on the stages of initiation, termination, and processing.) (10%)
19. Describe the pattern formation in Drosophila development. (10%) (note: homeotic gene, etc.)
20. The signals generated at the cell membrane by ligands such as growth factors and peptide hormones usually first transmit to second messenger system, then generate the ligand-specific and cell-specific responses.
 - (a) Many different receptor types can activate the same adenyl cyclase. What are the plausible physiological reason for this overlap? (3%)
 - (b) The number of ligand-activated second messenger system is small; in contrast, individual cells have receptors for many extracellular ligands. How are specific ligand-specific biological responses induced in specific cells? (6%)