

國立中山大學96學年度博士班招生考試試題

科目：細胞分子生物學 【生醫所】

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Answer the following questions:

1. Mention the major cyclins, cyclin-dependent kinases and cyclin-dependent kinase inhibitors that control mammalian cell cycle progression. (10 point)
2. Cellular proteins may undergo lipid modification. Write down five kinds of lipid modification and explain what is a GPI anchor protein. (10 point)
3. Write down three major kinds of enzymes that control the asymmetry of phospholipid bilayer of plasma membrane and describe the change of phospholipid distribution during apoptosis. (10 point)
4. Compare apoptosis, necrosis, autophagy by following characteristics (a) mechanism (b) alteration of cell morphology (b) nuclear change (c) enzymes activated. (10 point)
5. Explain the theory and experimental procedures of Chromatin immunoprecipitation (ChIP) assay. (10 point)
6. Write down the members of mammalian DNA methyltransferase and explain how DNA methylation regulates gene transcription. (10 point)
7. Mention three kinds of human hereditary diseases that are associated with DNA-repair defects and describe the DNA-repair system affected. (10 point).
8. Inflammation is linked with the development of many human diseases. Explain the pathway by which prostaglandins are generated from membrane lipid and their major metabolites. (10 point).
9. An X protein level was increased after drug treatment. However the mRNA level remained the same. Design two experiments to clarify whether the increase are caused by translation synthesis or protein stability. (10 point)
10. Explain what is histone code and describe how it controls gene transcription. (10 point).