國立高雄大學 115 學年度研究所碩士班招生考試試題

科目：分子生物學　　系所：生命科學系　　是否使用計算機：否
考試時間：100 分鐘　　本科原始成績：100 分

1. What is the central dogma of eukaryotic gene expression in molecular biology (10%)?

2. Please describe the principle of polymerase chain reaction (10%) and its application (5%).

3. (a) Define the function of a promoter of a gene (3%)? (b) Please compare the typical compositions of a bacterial promoter to a typical eukaryotic promoter (e.g., actin gene) (9%). (c) Define an enhancer of a eukaryotic gene (3%).

4. Please briefly describe and compare the molecular mechanisms of Base Excision Repair (BER) and Nucleotide Excision Repair (NER), highlighting the types of DNA damage repaired by each pathway (15%).

5. Please explain the mechanisms by which microRNA (miRNA) regulates gene expression (10%)

6. Please describe how three main types of RNA are involved in protein synthesis (15%).

7. Describe the characteristics of telomere in a eukaryotic chromosome. Explain why and how telomere is replicated differently as compared to the rest of the DNA in a eukaryotic cell (10 %).

8. DNA methylation patterns are frequently altered in cancer cells, which often exhibit global hypomethylation. Describe where DNA methylation typically occurs in the eukaryotic genome and identify the nucleotide residue that is most commonly methylated. Explain how DNA methylation influences gene transcription, and discuss how genome-wide hypomethylation may contribute to cancer development. (10%)

背面尚有試題