

系所組別： 臨床醫學研究所

考試科目： 分子生物學

考試日期：0307，節次：2

※ 考生請注意：本試題 可 不可 使用計算機

1. Yeast two hybrid (Y2H) is a system to identify protein-protein interactions *in vivo*. Please describe how the Y2H system works.(10%)
2. Posttranslational modification (PTM) is the chemical modification of a protein after its translation. Please name five of the functional groups added in PTM and describe their functions.(10%)
3. Briefly describe the following terms:(10%)
 - a. ChIP (Chromatin immunoprecipitation)
 - b. Site-directed mutagenesis
 - c. Alternative splicing
 - d. FISH (fluorescence in situ hybridization)
 - e. Alu repeats
4. Please list three different classes of DNA-binding domains and three different classes of transcription-activation domains found in eukaryotic transcription factors.(10%)
5. Please draw a growth curve of E.coli cells growing on a mixture of glucose and lactose ? Describe the Jacob-Monod model for regulation of the E.coli lac operon.(10%)
6. Please briefly describe how human genetic mutation(s) can cause a human disease.(10%)
7. Please describe how actin and actin binding proteins work together to drive cell migration in detail. (Rac, Rho, PI3K, Wasp, Arp2/3, profilin, gelsolin, capping proteins, cofilin, and myosin).(10%)
8. Please describe how mammalian cell cycle progression is regulated in detail. (distinct phases, driving force, quality control, monitoring, initiation and termination).(10%)
9. Please give an example of GPCR(G protein coupled receptor) mediated signaling pathway and describe its importance in regulating physiological function. (10%)
10. Please describe how transcription is regulated in mammalian cell. (10%)