

一、問答題與簡答題

1. What is the difference between a two hybrid screen and a one hybrid screen in yeast system (10%)
2. Describe the methods of directed evolution of enzymes and their application in protein engineering. (10%)
3. To isolate the plasmid(s) from *E. coli* transformant cells is a basic molecular technique. Describe the method of this technique. (10%)
4. What is RNAi (RNA interference) and how it works? (10%)
5. To separate proteins or nucleic acids from each other is very often necessary in biotechnology, describe the most common techniques to separate (a) RNA or DNA fragments (b) proteins. (10%)
6. Briefly explain the following: (20%)
 - a). Electroporation (4%)
 - b). Gel mobility shift assay (4%)
 - c). Metagenomics (4%)
 - d). DNA fingerprinting (4%)
 - e). Primer extension (4%)
7. Describe at least three strategies that can be used to block the transcription of a specific mRNA. (10%)
8. In order to prepare monoclonal antibody, one has to prepare hybridoma cells. Explain how to use hypoxanthine, aminopterin and thymidine (HAT) medium to select hybridoma cells from normal spleen cells and myeloma cells after fusion. (10%)
9. Polymerase chain reaction (PCR) is a useful tool for preparing large amount of DNA fragments. Describe four basic components of a PCR reaction and draw a temperature profile of a PCR cycle. (10%)