

系所組別： 生物化學暨分子生物學研究所甲組

考試科目： 生物技術概論

考試日期：0308·節次：3

※ 考生請注意：本試題 可 不可 使用計算機

1. Describe the principle of (a) gel filtration (b) ion exchange column chromatography in purification of proteins. (10 points)
2. To determine the expression of multiple genes at the same time, scientist may use RNase protection assay. Describe the principle of this assay, and what is the advantage of Rnase protection assay over Northern blotting? (10 points)
3. Scientists use differential display technique and microarray technique to analyze the gene expression differences between transformed cells and normal cells. Describe the principle of (a) differential display method (b) microarray. (10 points)
4. What are cancer stem cells? How does the study of cancer stem cells benefit cancer therapy? (10 points)
5. Describe the principle and advantages of (a) Baculovirus (b) Pichia expression system. (10 points)
6. What is induced pluipotent stem cells (IPS)? What risk factors we may encounter to use IPS in clinics? (10 points)
7. Please describe all the methods to engineer a mouse monoclonal antibody into human antibody (humanization or fully human)? (10 points)
8. A proinflammatory cytokine is the causing agent for a disease. Please describe all the strategy you can take to develop the drugs to target this cytokine. (10 points)
9. You discovered a novel gene from human genome database. Please describe your strategy to explore the biological functions of the novel gene. (10 points)
10. The therapeutic tool for a disease can be recombinant protein, small molecule, gene therapy, cell therapy. Please compare the advantages and disadvantages in these methods? (10 points)