

壹、選擇題(37.5): 1~15 題，每題 2.5 分。

1. 下列何種生物技術方法可以直接運用來分析細胞內蛋白質的表現。(1) RNAi. (2) Northern blotting. (3) Western blotting. (4) Southern blotting。
2. 如果你想要快速得到基因序列的突變，下列何種生物技術方法可以達成您的目的。(1) PCR. (2) Southern blotting. (3) RNAi. (4) Northern blotting。
3. 某生利用 Taq 酵素以 PCR 方式得到一基因並欲進行 cloning 實驗，若該生對此基因序列清楚時，應以何種方式進行基因 cloning，會有最高的效率。(1) TA cloning. (2) Blunt-end cloning. (3) Sticky-end cloning. (4) 以上皆可。
4. 下列何種酵素是 reverse transcriptase。(1) RNA-dependent DNA polymerase. (2) DNA-dependent RNA polymerase. (3) DNA-dependent DNA polymerase. (4) RNase H activity。
5. 下列何種酵素可以作用、分解 ds(double strand) DNA-RNA 雜合中的 RNA。(1) RNA-dependent DNA polymerase. (2) DNA-dependent RNA polymerase. (3) DNA-dependent DNA polymerase. (4) RNase H activity。
6. 下列何種酵素可以用來進行 transcription。(1) RNA-dependent DNA polymerase. (2) DNA-dependent RNA polymerase. (3) DNA-dependent DNA polymerase. (4) RNase H activity。
7. 三種相同分子量的 plasmid DNA;(a) supercoiled form. (b) linear form. (c) circular form，在相同濃度的電泳膠上移動速率為(1) $a > b > c$ (2) $b > a > c$ (3) $a > c > b$ (4) $c > b > a$ 。
8. 某生欲利用 Spectrophotometric 來定量自己所純化的 ds(double strand) DNA 原液，過程如下;某生從原液中取出 5 μl 後，加入 995 μl 的水充分混合成總體積為 1 ml，再以 OD260 來分析最後得到吸光值為 0.5，請問該生原液濃度為(1) 5 $\mu\text{g}/\mu\text{l}$. (2) 5000 $\mu\text{g}/\mu\text{l}$. (3) 0.1 $\mu\text{g}/\mu\text{l}$. (4) 100 $\mu\text{g}/\mu\text{l}$.
9. 0.2 pmole 的 A 物質溶在 100 μl 的水中，請問最終濃度為(1) 2000 nM. (2) 0.2 nM. (3) 0.2 $\mu\text{g}/\mu\text{l}$. (4) 2 nM.
10. Immunohistochemistry, Immunoprecipitation, ELISA, Western blotting 等以上何種試驗不需使用到抗體。(1) Immunohistochemistry. (2) Immunoprecipitation. (3) ELISA. (4) Western blotting. (5) 以上皆需。
11. 某生從事免疫相關研究，目前想要從血液中分離 T 淋巴球並進行細胞培養，請問以下何種試驗可以幫助他達到目的。(1) Flow Cytometry. (2) Transmission Electron Microscope. (3) Microarray. (4) Microinjection.
12. 下列四種 Vectors 中何者最不适合用來操作基因庫的建立。(1) pET 24(a). (2) BAC(bacterial artificial chromosome). (3) Cosmid. (4) YAC(yeast artificial chromosome).
13. 下列哪一個實驗可以運用來研究 DNA-Protein interaction。(1) RFLP (restriction fragment length polymorphism). (2) Gel Mobility Shift. (3) FISH (fluorescence in situ hybridization). (4) Yeast two-hybrid system.

14. 下列單位大小比較何者正確。(1) k(kilo) > m(milli). (2) m(milli) > n(nano). (3) p(pico) > f(femto). (4) 以上皆是。
15. μ (micro) 單位是(1) 10^{-3} . (2) 10^3 . (3) 10^{-6} . (4) 10^{-9} .

貳、配合題(62.5):16 - 40題，每題2.5分。

請將表格內之生物技術相關專有名詞，擇一最適切或最相關者，將其號碼填入下列各子題

1. DNA sequencing	2. DNA ligase	3. T7 promoter	4. S1 nuclease	5. polylinker
6. IgE	7. Subcloning	8. IgG	9. <i>src</i>	10. IgA
11. Indicator X-gal	12. Real-time PCR	13. IgM	14. Proofreading	15. Luciferase, GFP
16. Idiotypic Determinants	17. In situ hybridization	18. Terminal transferase	19. Polynucleotide kinase	20. Klenow fragment
21. Isotypic Determinants	22. Transient Transfection	23. Housekeeping genes	24. DNA fingerprinting	25. Baculovirus expression
26. An A260/A280 ratio of < 1.8 (DNA)	27. Yeast two-hybrid system	28. RNA interference (RNAi)	29. Type II restriction endonucleases	30. Alkaline phosphatase

16. Reporter gene.
17. This mechanism is mediated by double-stranded small RNA molecules.
18. Degrades only single-stranded DNA and RNA.
19. Assay locating genes in chromosomes.
20. Expressed in all cells because they provide basic functions needed for sustenance of all cell types.
21. Analyzes the differences between individuals of the fragments generated by using restriction enzymes to cleave regions that contain short repeated sequences
22. DNA polymerase with 3'-5' exonuclease activity.
23. Adds homopolymer tail to the 3'-OH ends of a linear duplex.
24. Sanger Chain-Termination Sequencing Method.
25. A portion of DNA polymerase; lacks the normal 5'→3' exonuclease activity which could degrade the 5'-overhangs before they could be filled in.
26. 10% - 15% of total serum Ig, predominant in external secretions, e.g., breast milk, saliva, tears, and mucus of the bronchial, genitourinary, and digestive tracts.

27. Recombinated plasmid: white colony; Self-ligated plasmid: blue colony.
28. Cleave dsDNAs at specific palindrome sequences.
29. A genetic assay for detecting protein-protein interactions.
30. Constant-region determinants that collectively define each H-chain class and subclass, and each L-chain type and subtype within a species
31. Mediates the immediate hyper-sensitivity reactions
32. A method to measure the quantity of a nucleic acid target using the PCR, the PCR amplification reaction is monitored in every cycle as it happens.
33. Joins two DNA molecules or fragments.
34. Means the nucleic acid preparation contaminants. (*e.g.* protein or phenol).
35. The unique amino acid sequence of the V regions of a given Ab.
36. Identification of this information in the genome of RSV was the first step in the study of retroviral oncogene
37. Most abundant in serum, 80% of total serum Ig
38. Adds a phosphate to the 5'-OH end of a polynucleotide to label it or permit ligation.
39. Remove terminal phosphates from either the 5' or 3' end..
40. Refers to the transfer of a fragment of cloned DNA from one vector to another.