

國立中山大學 109 學年度 碩士暨碩士專班招生考試試題

科目名稱：細胞暨分子生物學【生醫所碩士班】

— 作答注意事項 —

考試時間：100 分鐘

- 考試開始鈴響前不得翻閱試題，並不得書寫、劃記、作答。請先檢查答案卷（卡）之應考證號碼、桌角號碼、應試科目是否正確，如有不同立即請監試人員處理。
- 答案卷限用藍、黑色筆(含鉛筆)書寫、繪圖或標示，可攜帶橡皮擦、無色透明無文字墊板、尺規、修正液（帶）、手錶(未附計算器者)。每人每節限使用一份答案卷，不得另攜帶紙張，請衡酌作答。
- 答案卡請以 2B 鉛筆劃記，不可使用修正液（帶）塗改，未使用 2B 鉛筆、劃記太輕或污損致光學閱讀機無法辨識答案者，其後果由考生自行負擔。
- 答案卷（卡）應保持清潔完整，不得折疊、破壞或塗改應考證號碼及條碼，亦不得書寫考生姓名、應考證號碼或與答案無關之任何文字或符號。
- 可否使用計算機請依試題資訊內標註為準，如「可以」使用，廠牌、功能不拘，唯不得攜帶具有通訊、記憶或收發等功能或其他有礙試場安寧、考試公平之各類器材、物品（如鬧鈴、行動電話、電子字典等）入場。
- 試題及答案卷（卡）請務必繳回，未繳回者該科成績以零分計算。
- 試題採雙面列印，考生應注意試題頁數確實作答。
- 違規者依本校招生考試試場規則及違規處理辦法處理。

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科目名稱：細胞暨分子生物學【生醫所碩士班】

題號：427001

※本科目依簡章規定「不可以」使用計算機(混合題)

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一、選擇題

本部分為單選題(計 20 題，每題 2.5 分)

1. Which of the following is NOT a cytoskeleton protein? (A) Actin, (B) Microtubule, (C) Intermediate filament, (D) Syntaxin, (E) Spectrin
2. Which of the following is a coding RNA? (A) snRNA, (B) rRNA, (C) mRNA, (D) tRNA, (E) snoRNA
3. Lamin is a skeleton protein and found in (A) Plasma membrane, (B) Nucleus, (C) Golgi apparatus, (D) Mitochondrion, (E) Lysosome
4. Which of the following is the characteristic of lagging strand primers? (A) Composed of RNA, (B) Made by DNA polymerase, (C) Incorporated into the newly-synthesized strand, (D) Generated from 3' to 5', (E) All of them
5. Where dose protein glycosylation take place? (A) Plasma membrane, (B) Nucleus, (C) Golgi apparatus, (D) Mitochondrion, (E) Endoplasmic reticulum
6. During translation, the peptide bond formation requires (A) Ribosomal protein, (B) rRNA, (C) Charged tRNA, (D) GTP, (E) All of them
7. The carboxy-terminal domain (CTD) of RNA polymerase II involves (A) Promoter clearance, (B) Elongation, (C) Splicing, (D) Polyadenylation, (E) All of them.
8. Which of the following amino acid residue is NOT modified to regulate gene expression or signal transduction? (A) Alanine, (B) Lysine, (C) Serine, (D) Arginine, (E) Threonine
9. Eukaryotic primary transcripts are usually composed of (1) 5'-UTR, (2) Exon, (3) Intron, and (4) 3'-UTR, but their full length cDNAs only contain (A) 1+2+3, (B) 2, (C) 1+2+4, (D) 2+3, (E) 1+2+3+4.
10. Which protein does NOT directly contact DNA? (A) Histone, (B) Repressor, (C) RNA polymerase, (D) Co-activator, (E) TATA-box binding protein
11. The enzyme responsible for joining two separate DNA strands is (A) Helicase, (B) DNA polymerase, (C) Topoisomerase, (D) Ligase, (E) Transposase.
12. The structure that storages Ca^{++} in the cell is (A) Peroxisome, (B) Nucleus, (C) Golgi complex, (D) Mitochondrion, (E) Endoplasmic reticulum.
13. Which of the following chromosome region is transcriptionally active? (A) Barr body, (B) Heterochromatin, (C) Telomere, (D) Centromere, (E) None of them
14. The major activity of lysosome does NOT include (A) Breaking down biomolecules, (B) Fusing and digesting organelles, (C) Pumping in protons to keep its interior acidic, (D) Cooperating with proteasome, (E) Conducting autophagy.
15. Which of the following protein is responsible for vesicle trafficking (A) Importin, (B) Cohesin, (C) Kinesin, (D) Innexin, (E) Capping protein

試題請隨卷繳回，請留意背面是否有題

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16. Which of the following enzymes has proofreading activity? (A) Reverse transcriptase, (B) DNA polymerase II, (C) RNA polymerase, (D) Taq polymerase, (E) All of them
17. Endocytosis does NOT require (A) SNARE complex, (B) Clathrin, (C) Caveolin, (D) AP2 adaptor, (E) Dynamin
18. All of the following statements about nuclear pore complex (NPC) are true EXCEPT: (A) NPCs control the transport of molecules across the nuclear envelope, (B) No protein can freely pass through the NPC, (C) NPCs are made up of nucleoporins, (D) Importins transport cargo proteins with a nuclear localization signal (NLS) to the nucleus, (E) Ran is essential for the translocation of RNA and proteins through the nuclear pore.
19. All of the following enzymes can cleave the DNA strand and rejoin the breaks EXCEPT (A) Gyrase, (B) Endonuclease, (C) Integrase, (D) Transposase, (E) Recombinase.
20. Which of the following process is different in mitosis and meiosis? (A) Cell division, (B) DNA replication, (C) Chromosome condensation, (D) DNA recombination, (E) Chromatid alignment

二、申論題

(1) (每題 5 分，共 30 分)解釋名詞

- (a) Cytokinesis
- (b) Tight junction
- (c) Induced pluripotent stem cells
- (d) Okazaki fragments
- (e) Chromatin remodeling
- (f) Spliceosome

(2) 請說明 RNA interference 的作用機轉及其應用？(10 分)

(3) 請從細胞構造與膜蛋白生合成兩方面來簡述 prokaryotes 與 eukaryotes 的差異。(10 分)