慈 濟 大 學 9 8 學 年 度
研 究 所 碩 士 班 招 生 考 試 命 題 紙

科目：分子生物學

1. Please describe steps how pol II initiation complex is formed. (5%)

2. Please describe steps for the formation of spliosome in the splicing of pre mRNA. (5%)

3. What are the 3 major functions of CTD (C-terminal domain) of pol II polymerase? (3%)

4. Please give an example to describe function of an oncogene in normal cells and how it was turned oncogenic in tumorigenesis. (6%)

5. Please give 2 examples how tumor suppressor regulates cell functions to prevent tumor formation. (6%)

6. Signal transduction is important in various aspects of biomedical research. Use one application to illustrate its importance. (10%)

7. Explain a). tandemly repetitive sequences and b). intersperse repetitive sequences in human genome. (15%)

8. On basis of the following DNA sequence,

Promoter ----------→ ·

TATA Box ↓ start site of transcription stop site of transcription ↓

5` -- TATATTCTCGAATAGGTCCACGATGGAAGACTTAAGCTAAGCCGCCAGAAC—3'

a) please write down DNA sequence after replication and mRNA sequence after transcription, don't forget to label the 5' and 3' at ends of your sequence. (5%)

b) please write down amino acid sequence after translation, don't forget to label the N and C terminal at ends of your amino acid sequence. (5%)

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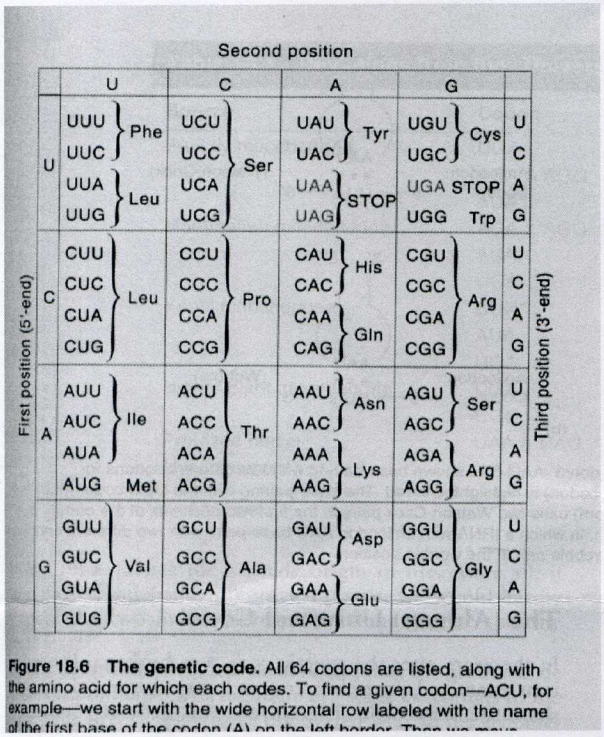

Second position

First position (5'-end)	U	C	A	G	Third position (3'-end)
U	UUU Phe	UCU Ser	UAU Tyr	UGU Cys	U
	UUC Phe	UCC Ser	UAC Tyr	UGC Cys	C
	UUA Leu	UCA Ser	UAA STOP	UGA STOP	A
	UUG Leu	UCG Ser	UAG STOP	UGG Trp	G
C	CUU Leu	CCU Pro	CAU His	CGU Arg	U
	CUC Leu	CCC Pro	CAC His	CGC Arg	C
	CUA Leu	CCA Pro	CAA Gln	CGA Arg	A
	CUG Leu	CCG Pro	CAG Gln	CGG Arg	G
A	AUU Ile	ACU Thr	AAU Asn	AGU Ser	U
	AUC Ile	ACC Thr	AAC Asn	AGC Ser	C
	AUA Ile	ACA Thr	AAA Lys	AGA Arg	A
	AUG Met	ACG Thr	AAG Lys	AGG Arg	G
G	GUU Val	GCU Ala	GAU Asp	GGU Gly	U
	GUC Val	GCC Ala	GAC Asp	GGC Gly	C
	GUA Val	GCA Ala	GAA Glu	GGA Gly	A
	GUG Val	GCG Ala	GAG Glu	GGG Gly	G

Figure 18.6 The genetic code. All 64 codons are listed, along with the amino acid for which each codes. To find a given codon—ACU, for example—we start with the wide horizontal row labeled with the name of the first base of the codon (A) on the left border. Then we move

9. Please use a diagram to explain the reason why DNA replication must obey the rule 5' to 3' direction. (8%)

10. Please explain IRES (Internal ribosome entry site) and describe its role in research. (7%)

11. Please describe the post-modifications of histones. (10%)

12. What are "Euchromatin" and "heterochromatin"? (10%)

13. What is "Kozak consensus sequence"? (5%)