

APOLLO

Protein synthesis

HL

Biology

First assessment 2025

7 questions | questions

10. What occurs during translation?

- I. Polypeptides synthesised on ribosomes
 - II. RNA polymerase catalyses polypeptide synthesis
 - III. Complementary base pairing between codons and anticodons
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- A. I and II only
 - B. I and III only
 - C. II and III only
 - D. I, II and III

Turn over

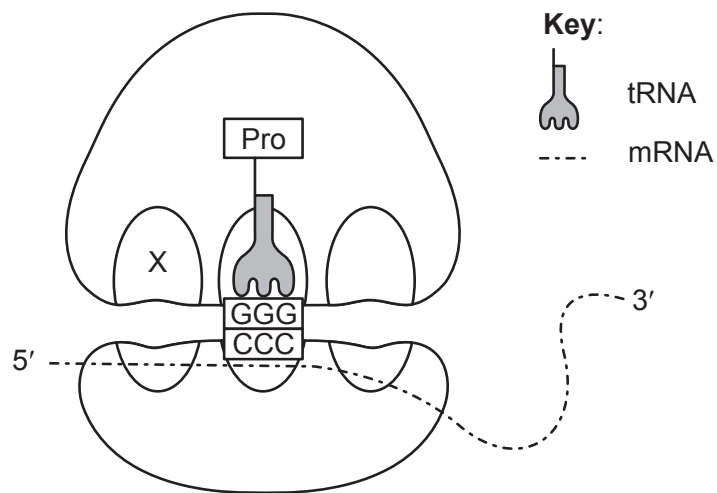
10. Which sequence of mRNA bases and amino acids could be produced by transcription and translation of the DNA molecule shown?

3' AAAGTGGCACGTATATTT 5'
5' TTTCACCGTGCATATAAA 3'

		2nd base in codon					
		U	C	A	G		
1st base in codon	U	Phe	Ser	Tyr	Cys	U	3rd base in codon
		Phe	Ser	Tyr	Cys	C	
		Leu	Ser	STOP	STOP	A	
		Leu	Ser	STOP	Trp	G	
	C	Leu	Pro	His	Arg	U	
		Leu	Pro	His	Arg	C	
		Leu	Pro	Gln	Arg	A	
		Leu	Pro	Gln	Arg	G	
	A	Ile	Thr	Asn	Ser	U	
		Ile	Thr	Asn	Ser	C	
		Ile	Thr	Lys	Arg	A	
		Met	Thr	Lys	Arg	G	
	G	Val	Ala	Asp	Gly	U	
		Val	Ala	Asp	Gly	C	
		Val	Ala	Glu	Gly	A	
		Val	Ala	Glu	Gly	G	

	Sequence of mRNA bases	Sequence of amino acids
A.	UUU-GAG-GCU-CGA-UAU-UUU	Phe-Glu-Ala-Arg-Tyr-Phe
B.	AAA-CUC-CGA-GCU-AUA-UUU	Lys-Leu-Arg-Ala-Ile-Phe
C.	UUU-CAC-CGU-GCA-UAU-AAA	Phe-His-Arg-Ala-Tyr-Lys
D.	AAA-GUG-GCA-CGU-AUA-UUU	Lys-Val-Ser-Arg-Ile-Phe

11. A ribosome with three binding sites, an mRNA molecule and a tRNA molecule are shown.



What would be the effect of blocking the left-hand binding site labelled X?

- A. The GGG tRNA would not be able to exit the ribosome.
- B. A second tRNA would not be able to bind.
- C. A second tRNA would enter the right-hand binding site.
- D. The ribosome would move to the left.

10. The table shows information on the genetic code of four different mRNA sequences. Which sequence demonstrates degeneracy in the genetic code?

	mRNA sequence	Amino acids
A.	UUU UUA UCU	Phe Leu Ser
B.	CUU CCU CUU	Leu Pro Leu
C.	AUG ACG AAG	Met Thr Lys
D.	GUU GGU GUG	Val Gly Val

- 9.** Which of the following is a consequence of the degeneracy of the genetic code?
- A. Codons affected by mutagens always code for non-functional proteins.
 - B. There are variations in the amino acid sequences for the same protein.
 - C. Some base mutations cause no changes in protein structure.
 - D. A codon may code for more than one amino acid in response to environmental changes.

20. What is a consequence of nucleases binding to mRNA?

- A. Transcription stops.
- B. mRNA binds to ribosomes.
- C. More mRNA is synthesized.
- D. mRNA cannot be translated again.

11. The table shows the mRNA codons for three amino acids.

Valine	Threonine	Proline
GUU	ACU	CCU
GCC	ACC	CCC
GCA	ACA	CGA
GCG	ACG	CCG

Which substitution mutation of a base triplet on a DNA strand will lead to the same polypeptide being formed at translation?

- A. TGA to TCA
- B. CGT to CTA
- C. CAA to CGA
- D. GCT to GGA

Turn over