

CONCEPT: REVIEW OF TRANSCRIPTION VS TRANSLATION

●Let's review, compare, & contrast transcription & translation:

	Transcription	Translation
Product Formed	RNA Molecule	_____
Macromolecule Change?	_____ Nucleic Acid ➡ Nucleic Acid	YES Nucleic Acid ➡ Protein
Major Enzyme/Structure	RNA Polymerase	_____
Location	_____	Cytoplasm
Direction of Synthesis	5' ➡ 3'	_____ ➡ _____

PRACTICE: What is the central dogma of molecular biology directly referring to?

- a) Unidirectional Translation.
- b) Multidirectional Translation.
- c) Unidirectional Transcription.
- d) Multidirectional Transcription & Translation.

PRACTICE: Consider a DNA template strand of the following sequence: 5'-A C T G C C A G G A A T-3'.

A) What is the sequence of the corresponding DNA coding strand? Include directionality.

DNA Template Strand: 5'-A C T G C C A G G A A T-3'.

DNA Coding Strand:

B) What is the sequence of the corresponding mRNA strand? Include directionality.

mRNA Strand:

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PRACTICE: Consider a DNA coding strand with the following sequence: 3'-C T T C A T A G C T C G-5'.

Use the genetic code to determine the corresponding amino acid sequence of the translated protein.

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

DNA Coding Strand: 3'- C T T C A T A G C T C G -5'

mRNA Strand:

Protein Sequence:

PRACTICE: Which of the following polypeptide chains are synthesized from the RNA sequence:

5' – AUGAUCCGAAGUGGCACAGCAUAA - 3'

- Met-His-Asn-Ser-Glu-Thr-Tyr-Stop.
- Met-Ile-Arg-Ser-Gly-Thr-Ala-Stop.
- Met-Ile-Ser-Arg-Glu-Thr-Asp-Stop.
- Met-Phe-Ala-Ser-Gly-Tyr-Ala-Stop.

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