

Gene expression depends on the correct reading of each codon of the gene.

Procedure

Use Table 15.3 to answer each of the following questions.

Table 15.3 Messenger RNA Codons and Their Corresponding Amino Acids

First Base	Second Base				Third Base
	U	C	A	G	
U	UUU phenylalanine	UCU serine	UAU tyrosine	UGU cysteine	U C A G
	UUC phenylalanine	UCC serine	UAC tyrosine	UGC cysteine	
	UUA leucine	UCA serine	UAA stop**	UGA stop**	
	UUG leucine	UCG serine	UAG stop**	UGG tryptophan	
C	CUU leucine	CCU proline	CAU histidine	CGU arginine	U C A G
	CUC leucine	CCC proline	CAC histidine	CGC arginine	
	CUA leucine	CCA proline	CAA glutamine	CGA arginine	
	CUG leucine	CCG proline	CAG glutamine	CGG arginine	
A	AUU isoleucine	ACU threonine	AAU asparagine	AGU serine	U C A G
	AUC isoleucine	ACC threonine	AAC asparagine	AGC serine	
	AUA isoleucine	ACA threonine	AAA lysine	AGA arginine	
	AUG methionine*	ACG threonine	AAG lysine	AGG arginine	
G	GUU valine	GCU alanine	GAU aspartate	GGU glycine	U C A G
	GUC valine	GCC alanine	GAC aspartate	GGC glycine	
	GUA valine	GCA alanine	GAA glutamate	GGA glycine	
	GUG valine	GCG alanine	GAG glutamate	GGG glycine	

* AUG is an initiator codon. It also codes for the amino acid methionine.
 ** UAA, UAG, and UGA are terminator codons.

Analysis

1.) An mRNA strand contains the following nucleotide sequence: AUG-CCC-ACU-ACA-UAG. What amino acid sequence does this mRNA code for?

2.) A DNA strand contains the following nucleotide sequence: TACTGCCTCCCCATAAGAATT.

A) What is the nucleotide sequence of the mRNA strand that is transcribed from this DNA template?

B) What is the amino acid sequence of the polypeptide that is produced from this mRNA strand?

3.) If a tRNA anticodon sequence is UUCGGCAACUAGGGG

A) What was the original DNA strand template sequence?

B) What is the mRNA sequence would be used by the ribosomes to use translate this tRNA sequence?

C) What amino acid sequence does the mRNA code for?
