Math Tutor INTERPRETATION OF THE GENETIC CODE

In protein synthesis, the DNA sequence of bases is transcribed onto messenger RNA (mRNA). The mRNA base sequence is the complement of the DNA sequence except that uracil takes the place of thymine as the complement of adenine.

Problem-Solving TIPS

- Find the first base of the mRNA triplet along the left side of the table.
- Follow that row to the right until you are beneath the second base of the triplet.
- Move up or down in the square that corresponds to the second base until you are even, on the right side of the chart, with the third base of the triplet.

The Genetic Code (mRNA)

First base	Second base U	Second base C	Second base A	Second base G	Third base
U	UUU Phenylalanine UUC UUA Leucine UUG	UCU UCC UCA Serine UCG	UAU Tyrosine UAC UAA Stop UAG	UGU Cysteine UGC UGA—Stop UGG—Tryptophan	U C A G
C	CUU CUC Leucine CUA CUG	CCU CCC Proline CCA CCG	CAU Histidine CAC CAA Glutamine CAG	CGU CGC Arginine CGA CGG	U C A G
A	AUU AUC Isoleucine AUA AUG—Start	ACU ACC Threonine ACA ACG	AAU Asparagine AAC AAA Lysine AAG	AGU Serine AGC AGA Arginine AGG	U C A G
G	GUU GUC Valine GUA GUG	GCU GCC Alanine GCA GCG	GAU Aspartic acid GAC GAA Glutamic acid GAG	GGU GGC Glycine GGA GGG	U C A G

SAMPLE

What sequence of amino acids will be incorporated into protein as a result of the mRNA sequence UUACCCGAGAAGUCC?

Divide the sequence into groups of three to clearly see the separate codons.

UUACCCGAGAAGUCC = UUA | CCC | GAG | AAG | UCC

Now, use the table to determine the match between codons and amino acids.

UUA	CCC	GAG	AAG	UCC
leucine	proline	glutamic acid	lysine	serine

PRACTICE PROBLEMS

1. What amino acid sequence will be added to a protein as a result of the mRNA sequence UUACACGACUAUAAUUGG?

2. What amino acid sequence will be added to a protein as a result of the mRNA sequence CUAACCGGGUGAGCUUCU?