



Protein Synthesis-Translation



Translation

Instructions in mRNA are decoded to produce a protein

How does the 4 letter alphabet of DNA, code for 20 different amino acids?

Amino acids are coded by mRNA base sequences

Translation

A _____ is a sequence of

that code for a specific amino acid.

The genetic code matches

One _____ initiates translation (_____)

Three _____, each one can terminate translation (_____, _____, _____)

Note: more than one codon can code for a single amino acid.

_____ is the link between _____

On one end, the _____ is a set of three nucleotides that is complementary to an mRNA codon.

On the other end, _____ is carried

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

The genetic code, written by convention in the form in which the Codons appear in mRNA. The three terminator codons, UAA, UAG, and UGA, are boxed in red; the AUG initiator codon is shown in green.

Each tRNA carries only one _____

Translate the following mRNA sequence into amino acids

Template DNA: TAC CGG ATG CTA GGA TCA

Template mRNA: AUG GCC UAC GAU CCU AGU

Amino Acids:

Ribosomes (aka rRNA) are Protein Factories

Ribosomes consist of 2 subunits

-The large subunit has _____

-The small subunit _____

How Translation Occurs

- The ribosome assembles and binds onto the mRNA near the start codon
- For translation to begin, tRNA binds to a _____ (AUG – methionine)
- A complementary RNA molecule binds to the exposed codon
- The tRNA matches the next codon and carries with it a _____
- The ribosome helps form a _____ between the amino acids
- The ribosome pulls the mRNA strand the length of one codon
- The now empty tRNA molecule _____
- A complementary tRNA molecule binds to the next exposed codon; and a new peptide bond is formed between amino acids held by tRNA
- The ribosome continues to move down the mRNA until _____
“blueprint message” has been read
- Once the _____ is reached, the ribosome releases the protein and disassembles.

Protein Folding

After polypeptide chains are released from the ribosome

The Result of Translation

_____ have several structural levels of _____

Protein Synthesis Overview

