

Codon Overview

Codons are the fundamental reading unit of mRNA for translation. They are three-nucleotide sequences that code for specific amino acids and/or the starting and stopping of translation. AUG is the start codon for eukaryotic genomic translation, but mitochondrial and prokaryotic genomes can use other start codons. tRNA units have matching anti-codon sequences, meaning the “AUG” codon corresponds to “UAC” on a tRNA. Each codon codes for one specific amino acid, which is brought to the ribosome by the tRNA. However, multiple codons code for the same amino acid. For example, CAA always codes glutamine, but CAG also codes glutamine. AUG, the start codon, always codes methionine which means each protein chain starts with methionine. There are three codons that signal translation termination: UAG, UGA, UAA. They result in the binding of release factors which disassociate ribosomal subunits and release the peptide chain.



PLAY PICMONIC

Characteristics

mRNA Read In Three Nucleotide Chunks

Mail-(RNA)-rhino putting mail into (3) Tree Nuclear-toad

mRNA is read in sets of three nucleotides in the reading frame designated by the first start codon read.

AUG Is Start Codon

AUG in Green Condom

AUG is the start codon, so once that sequence is read the ribosome will begin to synthesize the polypeptide chain. Mitochondrial and prokaryotic genomes can have other start codons as well.

Matching tRNA Anticodon

transformer-Rhino with its Ant-tie matching Condom

tRNAs (transfer RNA) have complementary sequences to the codons, called anti-codons. These sequences match up with the appropriate codon being read.

Amino Acid Specific (To Codon)

Green Condom matches Amigo Acidic-lemon with Green hat

Each codon (three nucleotide RNA sequence) can only code for one amino acid, but multiple codons can code for an amino acid. For example, UCU always codes for serine, but UCC, UCA, UCG, AGU, and AGC also code for serine.

AUG Codes For Methionine

MET-shirt worn by Amigo Acidic-lemon

AUG, the start codon, always codes for methionine in eukaryotes and a modified methionine in prokaryotes.

UAA, UAG And UGA Are Termination Codons

(UAA) Umbrella-Apple-Apple, (UAG) Umbrella-Apple-Gold, and (UGA) Umbrella-Gold-Apple on Stop Sign-Condom

There are three stop codons that signal the end of a protein and termination of translation. These codons are UAG, UGA, and UAA. These codons signal release factor binding which cause ribosomal sub-units to disassociate and release the amino acid.