

Codon Overview

Codons are three nucleotide sequences that are read and translated into proteins. By definition, codons are defined by the reading frame established by the initial nucleotide that starts translation.



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 (codons) within the reading frame, which is established by the first start codon (usually AUG).

AUG is Start Codon

[AUG in Green Condom](#)

AUG is the primary start codon in eukaryotes, signaling the ribosome to begin synthesizing the polypeptide chain. In prokaryotic and mitochondrial genomes, alternative start codons (such as GUG and UUG) may also be used.

Matching tRNA Anticodon

[transformer-Rhino with its Ant-tie matching Condom](#)

tRNAs (transfer RNAs) have complementary sequences to mRNA codons, called anticodons. Each tRNA pairs with its specific codon during translation to ensure the correct amino acid is added to the growing polypeptide chain.

Amino Acid Specific (To Codon)

[Green Condom matches A-mean-ol' Acidic-lemon with Green hat](#)

Each codon (a three-nucleotide RNA sequence) specifies only one amino acid, but multiple codons can code for the same amino acid. For example, UCU codes for serine, and so do UCC, UCA, UCG, AGU, and AGC.

AUG Codes for Methionine

[MET-shirt worn by A-mean-ol' Acidic-lemon](#)

AUG, the start codon, always codes for methionine in eukaryotes and N-formylmethionine (fMet) in prokaryotes, where it serves as the initiating amino acid in translation.

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 (UAG, UGA, and UAA) that signal the end of protein synthesis and the termination of translation. These codons promote the binding of release factors, which cause the ribosomal subunits to dissociate and release the newly synthesized polypeptide.