Translation: Initiation

Translation is the process of creating proteins from the genetic code. It begins with an AUG codon that signals the start of translation. This AUG codon is read on the mRNA template. The initiation complex forms and consists of mRNA, initiator tRNA, and both small and large ribosomal subunits. This formation is assisted by GTP and initiation factor, which help bring the complex together. In response to the first AUG codon, a Met-tRNA will bring the first amino acid, methionine. The chain of amino acids is created in elongation as the ribosome reads the codons in a 5' to 3' direction. tRNA molecules continue to bring in the appropriate amino acids with matching anti-codon sequences and the peptide chain is extended until a stop codon is reached.



PLAY PICMONIC

Translation: Initiation

Ribosome Binds mRNA
Rabbit-Zombie binds to Mail-(RNA)-rhino
The mRNA is bound to by a ribosomal complex. This complex reads the mRNA in the 5’ to 3’ direction, looking for the start codon sequence, which is a signal for the initiation complex to be assembled.

Complex Reads 5' to 3'
Reading-book from (5) Hand to (3) Tree
The ribosomal unit that attaches to the mRNA reads this nucleic acid in the 5’ to 3’ direction.

AUG Start Codon
AUG-calendar Starting-line Condom
The AUG codon is the classic start codon for translation, and codes for methionine. When this codon is encountered, protein translation starts.

Initiation Complex Forms
Initiation-screen on Complex-building
The initiation complex forms, consisting of mRNA, initiator tRNA, small ribosomal subunits, and large ribosomal subunits.

GTP and Initiation Factor Bring Complex Together
Gold-TP bringing Complex-building together
GTP and initiation factor are a nucleotide and a protein that help bring the complex together. They work to do this when they encounter the components of the initiation complex, such as the mRNA, initiator tRNA, small ribosomal subunits and large ribosomal subunits.

Met-tRNA Binds P Site
transformer-Rhino with METS binds to (P) Pea
Met-tRNA brings the first amino acid because the start codon, AUG, codes for methionine. The tRNA component binds to the P site on the mRNA.

tRNA With Bound Amino Acids Binds A Site
transformer-Rhino with Amigo Acidic-lemon binds to (A) Apple
tRNAs bring in matching amino acids, because they have an anti-codon region that matches up to specific mRNA codons. These matching anti-codons have amino acids attached to their 3' tail. In translation, these tRNAs bind to the A site.

Amino Acid Chain Created in Elongation
Chain of Amigo-lemons and Long-john
In elongation, the amino acid chain is created by joining each of the new amino acids brought in by tRNA.

Sign up for FREE at picmonic.com