CONCEPT: STEPS OF TRANSLATION

●Similar to transcription, the process of translation also consists of _____ steps:

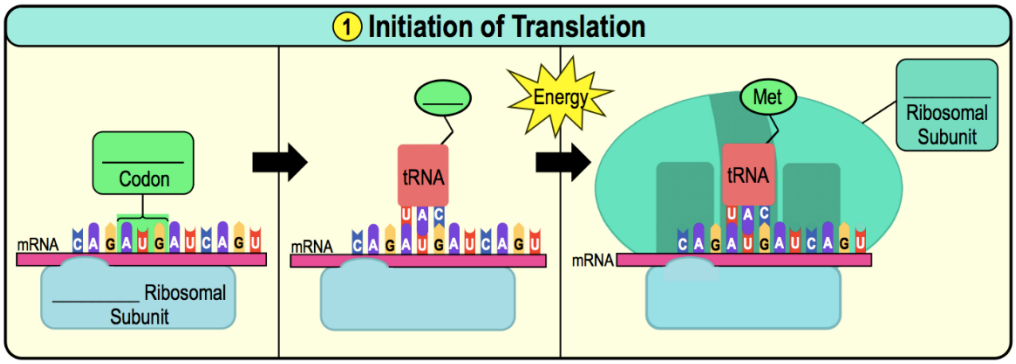
1. _____ 2. _____ 3. _____

1) Initiation of Translation

● **Initiation**: the small ribosomal subunit first binds the mRNA & a tRNA before the large ribosomal subunit binds.

□ The start codon (_____) specifies the amino acid Methionine (Met) at the *start* of translation.

□ Several proteins called "*initiation factors*" & *energy* are required.



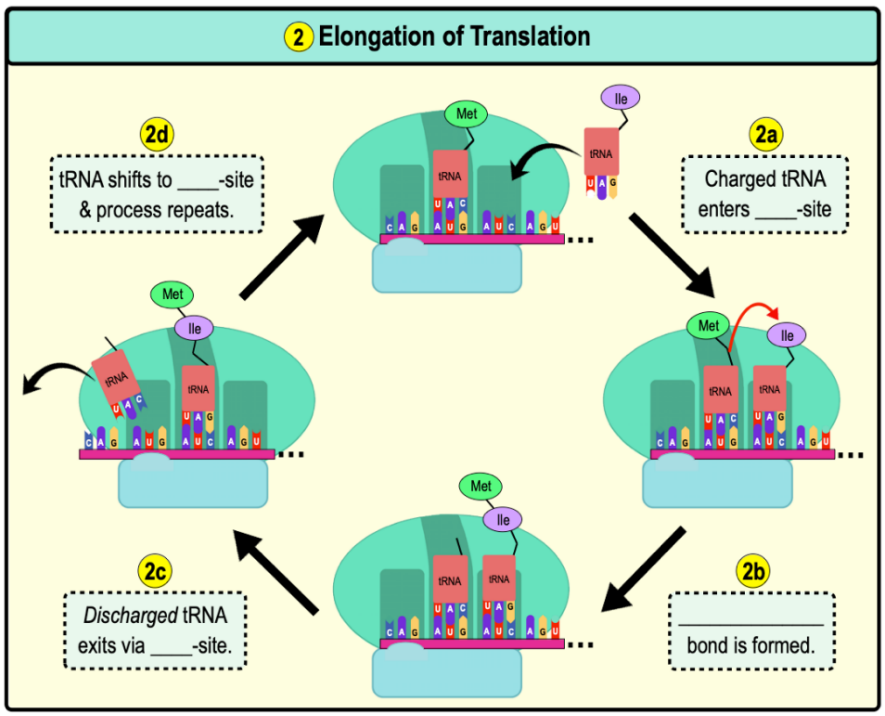
2) Elongation of Translation

●**Elongation**: amino acids are added one by one to the previous amino acid at the _____-terminus of the growing chain.

□ Polypeptide chain grows from its _____-terminus to its _____-terminus.

□ Ribosome reads mRNA _____ 5' →3', pairing them with *tRNA anti-codons* that specifies one *amino acid*.

□ New tRNAs enter ribosome's _____ site, then shift into the _____ site, & finally the _____-site before exiting.



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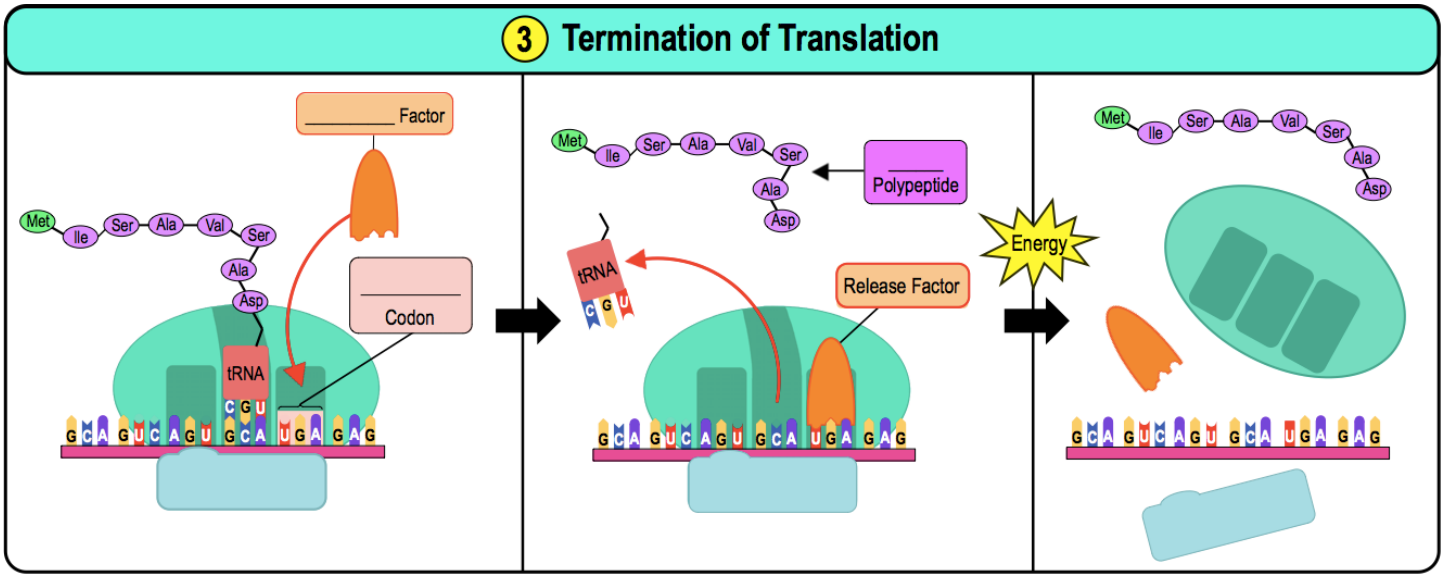
3) Termination of Translation

●**Termination**: a _____ codon reaches the ribosome's A-site, triggering *release factor* proteins to bind.

□ The polypeptide chain is cleaved & released from the tRNA & the translation assembly comes apart.



PRACTICE: The tRNA for which amino acid is the first to enter the ribosome?

a) Arginine.
c) Methionine.
b) Lysine.
d) Histidine.

PRACTICE: Which of the following processes is the first event to take place in translation?

a) Base pairing of charged methionine-tRNA to AUG of the messenger RNA.
b) Binding of the larger ribosomal subunit to smaller ribosomal subunits.
c) The ribosome reaches a stop codon.
d) The small subunit of the ribosome recognizes and attaches to the mRNA.

PRACTICE: When is a peptide bond formed during the process of translation?

a) During the elongation phase, just after a tRNA charged with the next amino acid binds to the A site.
b) During the termination phase, just after the release factor binds to the A site.
c) During the elongation phase, just after a tRNA that has lost its amino acid and exits the E site.

CONCEPT: STEPS OF TRANSLATION

PRACTICE: Which of the following does not occur during translation's termination step?

a) The first tRNA brings the amino acid methionine to the ribosome.
b) The small and large ribosomal subunits separate from each other.
c) The polypeptide is released from the ribosome.
d) A "stop" codon is reached by the ribosome along the mRNA.

PRACTICE: What is the function of the release factor during translation?

a) It binds to the stop codon in the A site in place of a tRNA.
b) It releases the amino acid from its tRNA to allow the amino acid to be added to the growing polypeptide.
c) It supplies a source of energy for termination of translation and the release of the polypeptide.
d) It releases the ribosome from the rough endoplasmic reticulum and allows the polypeptide to enter the cytosol.