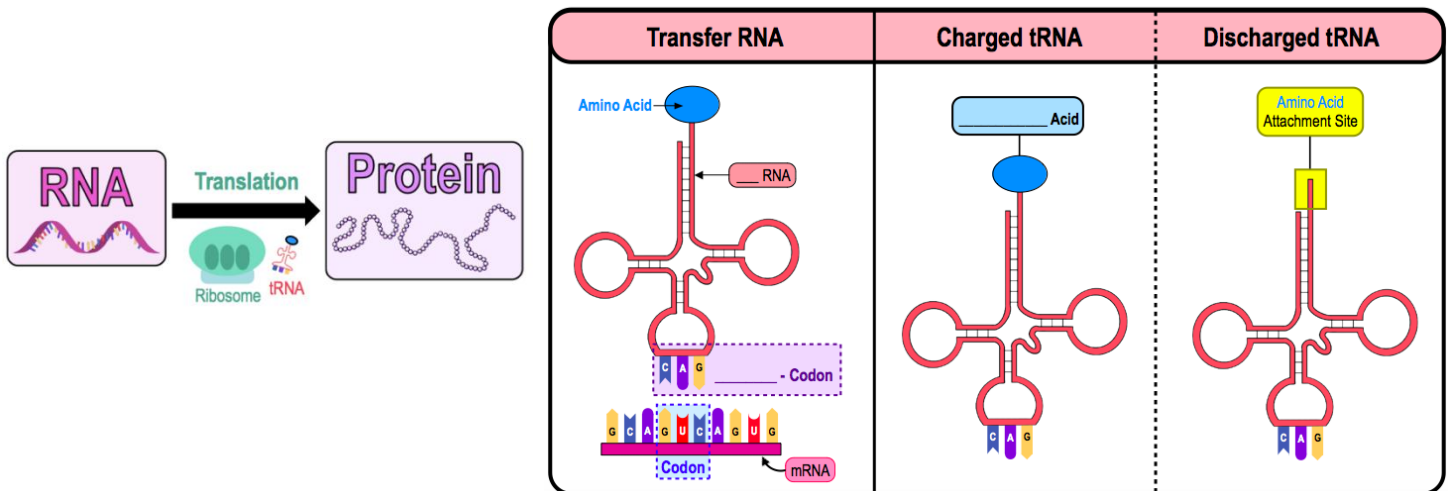


CONCEPT: INTRODUCTION TO TRANSLATION

- **Recall: Translation:** process that builds _____ using the encoded messages of mRNA.
 - **Ribosomes:** complex structure that builds _____ & performs _____.
 - **Transfer RNA (tRNA):** RNA structure that carries/transfers _____ acids to ribosomes.
 - tRNA contains _____-codons that pair with mRNA codons during translation.
 - *Charged* tRNA is attached to an amino acid; *Discharged* tRNA is _____ attached to an amino acid.

EXAMPLE: The different variations of transfer RNA (tRNA) during translation.

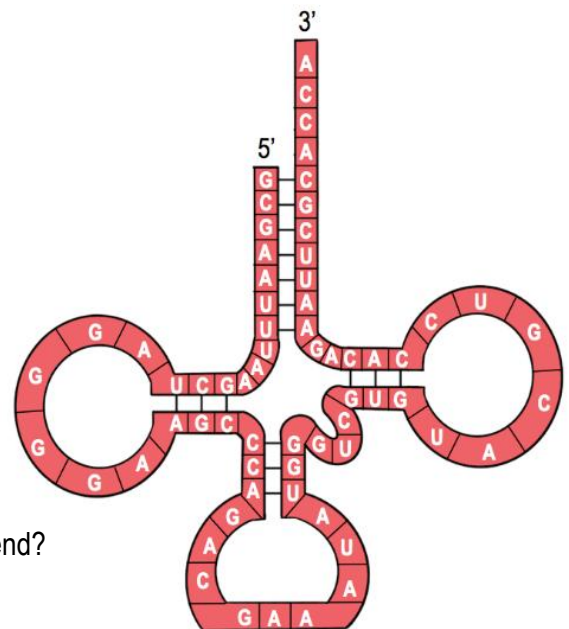


PRACTICE: What type of bonding is responsible for maintaining the shape of the tRNA molecule shown in the figure?

- a) Ionic bonding between phosphates.
- b) Hydrogen bonding between base pairs of nucleotides.
- c) Van der Waals interactions between hydrogen atoms.
- d) Peptide bonding between amino acids.

PRACTICE: The tRNA shown in the figure has its 3' end projecting beyond its 5' end. Which of the following processes will occur at this 3' end?

- The amino acid binds covalently.
- The excess nucleotides (ACCA) will be cleaved off at the ribosome.
- The small and large subunits of the ribosome will attach to it.
- These nucleotides represent the anti-codon.

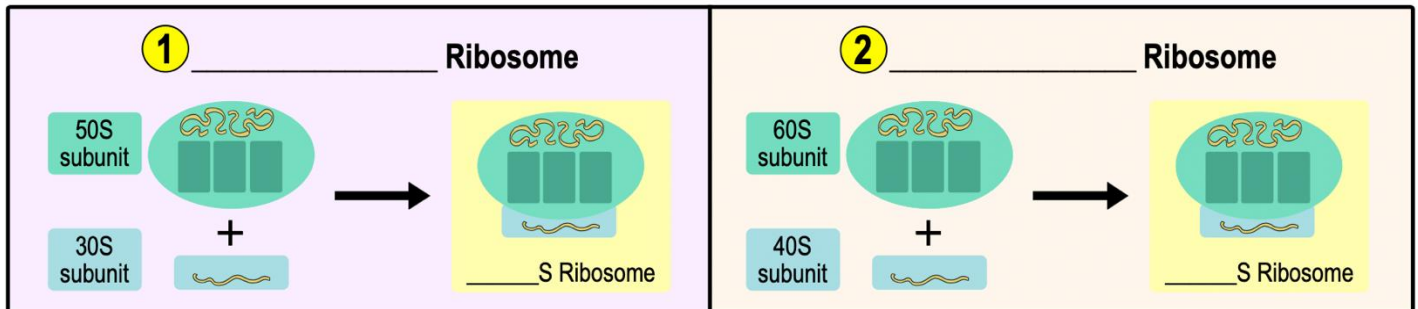


CONCEPT: INTRODUCTION TO TRANSLATION

Ribosome Subunits

- Ribosomes consist of a small & large ribosomal _____, each made of proteins & rRNA.
 - 1 Prokaryotes have _____S ribosomes consisting of a large _____S & small _____S ribosomal subunits.
 - 2 Eukaryotes have _____S ribosomes consisting of a large _____S & small _____S ribosomal subunits.

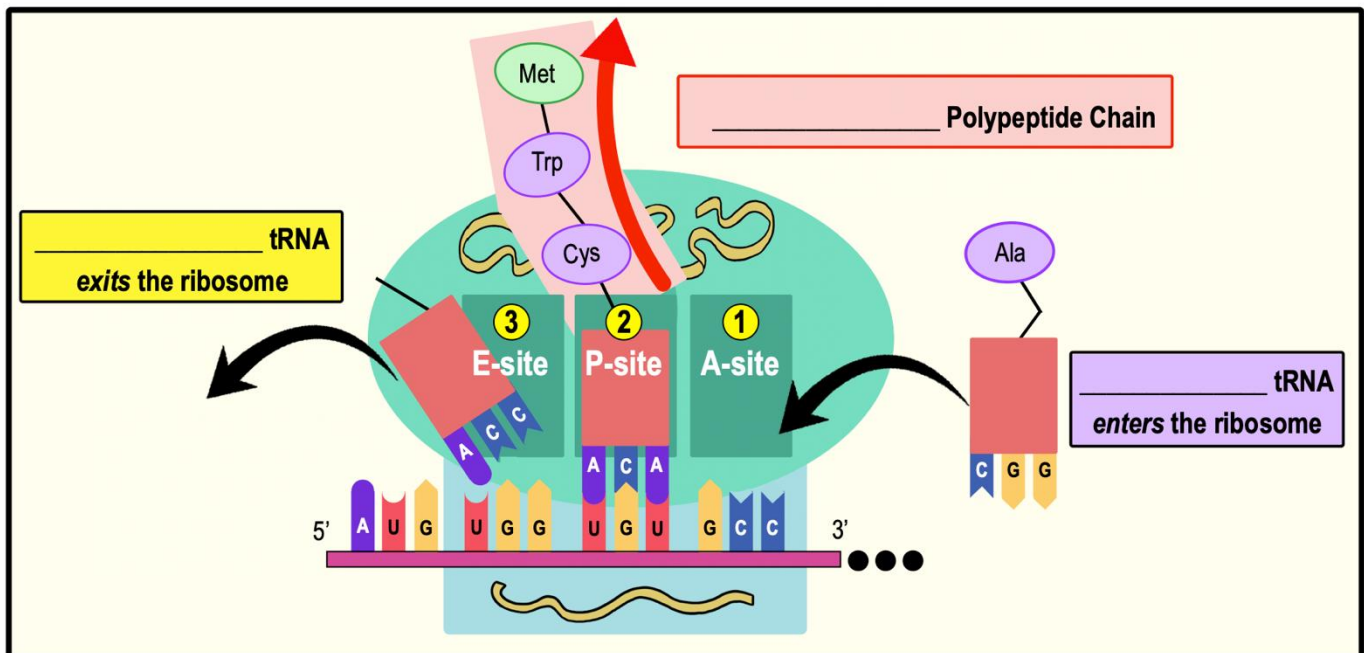
EXAMPLE: Prokaryotic vs. Eukaryotic Ribosomal Subunits.



Ribosomal tRNA Binding Sites

- Each ribosome has _____ tRNA binding sites:
 - 1 _____minoacyl-tRNA Binding Site (_____ -Site): holds the tRNA carrying the next amino acid to be added.
 - 2 _____eptidyl-tRNA Binding Site (_____ -Site): holds the tRNA carrying the **growing** polypeptide chain.
 - 3 _____xit Site (_____ -Site): discharged tRNAs leave the ribosome from this site.

EXAMPLE: Overview of tRNA binding sites.



CONCEPT: INTRODUCTION TO TRANSLATION

PRACTICE: A ribosome has three tRNA binding sites. Which answer matches the tRNA binding site with the correct function:

- a) The A-site acts as the loading site, holding the tRNA with the next amino acid in the polypeptide sequence.
- b) The E-site releases charged tRNA from the ribosome.
- c) The P-site is holding the growing strand of amino acids making up the polypeptide.
- d) A and B are correct.
- e) B and C are correct.
- f) A and C are correct.
- g) All of the above are correct.

PRACTICE: Which of the following statements concerning ribosomes are true?

- a) Several ribosomes are often attached to and translating the same mRNA.
- b) Ribosomes join amino acids to form a polypeptide.
- c) Ribosomes have a binding site for mRNA and three binding site for tRNA molecules.
- d) No protein synthesis within a cell would occur without ribosomes.
- e) All of the above statements are true.

PRACTICE: The direction of ribosome movement during translation is in the _____.

- a) 3' → 5' direction of DNA.
- b) 5' → 3' direction of tRNA.
- c) 3' → 5' direction of mRNA.
- d) 5' → 3' direction of mRNA.

PRACTICE: Many antibiotics work by blocking the function of ribosomes. Therefore, these antibiotics will:

- a) Block DNA synthesis in eukaryotic cells.
- b) Block protein synthesis in prokaryotes.
- c) Block RNA synthesis in prokaryotes.
- d) Block viral DNA in prokaryotes.
- e) Block protein synthesis in eukaryotes.