

## Messenger RNA (mRNA)

- The start of the instructions is called the \_\_\_\_\_.
- The start codon's code is \_\_\_\_\_. It codes for an amino acid called \_\_\_\_\_.

Start Codon

- mRNA carries the code for building a \_\_\_\_\_.
- The \_\_\_\_\_ "reads" the code and builds the \_\_\_\_\_.
- The protein building code is a triplet code; every \_\_\_\_\_ nucleotides codes for one \_\_\_\_\_. Three bases that code for an amino acid are together called a \_\_\_\_\_.

- When the ribosome reaches a \_\_\_\_\_ codon, it stops translating and building the \_\_\_\_\_.
- There are 3 \_\_\_\_\_: UAA, UGA, UAG. Stop codons do not code for an \_\_\_\_\_.

Stop Codon

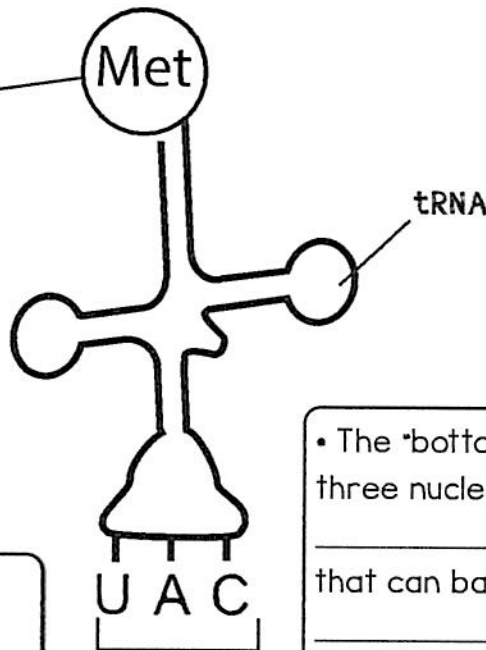
Other codons



Amino acid

Met

- The "top" of the tRNA attaches a specific \_\_\_\_\_.
- Different \_\_\_\_\_ connect to different \_\_\_\_\_.



- tRNA is the molecule that helps connect the \_\_\_\_\_ to the right \_\_\_\_\_ during translation.

- The "bottom" of the tRNA has three nucleotides that form the \_\_\_\_\_, a three base triplet that can basepair with a specific \_\_\_\_\_ on the \_\_\_\_\_.

Anticodon

## Transfer RNA (tRNA)

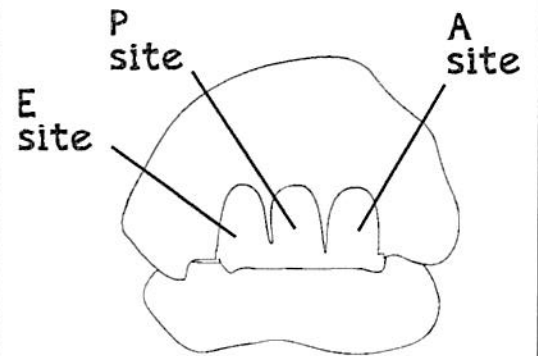
(Along the sides of the tRNA, there are also RNA nucleotides, but they aren't shown in this picture.)

Name: \_\_\_\_\_

# RNA Types

## Ribosome

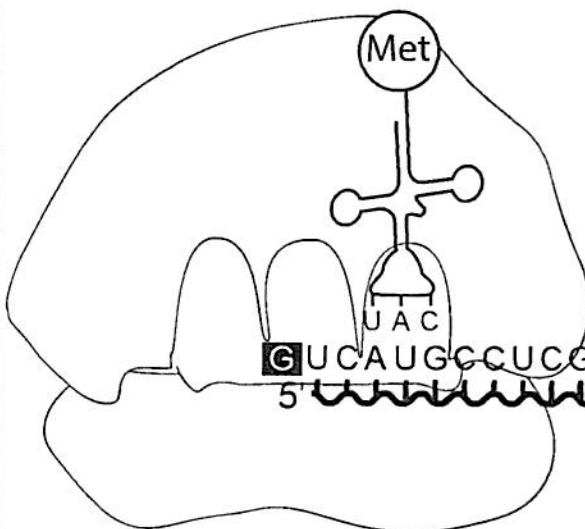
- The ribosome is the molecular machine that builds \_\_\_\_\_ using \_\_\_\_\_ instructions.
- The ribosome is made up of \_\_\_\_\_ and \_\_\_\_\_.
- It has two subunits: one \_\_\_\_\_ and one \_\_\_\_\_.
- It has three sites: \_\_\_\_\_, \_\_\_\_\_, and \_\_\_\_\_ sites.



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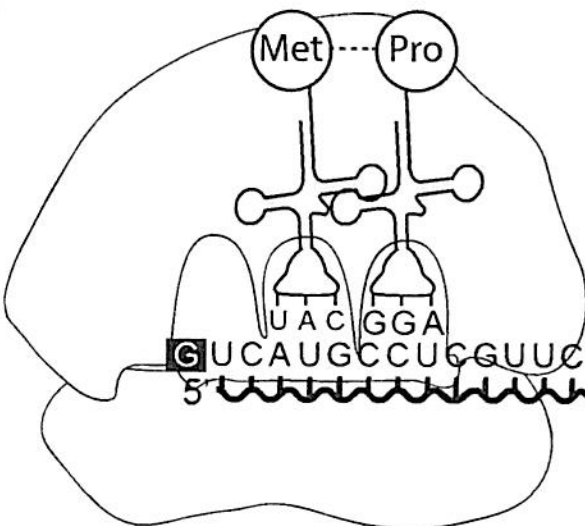
## Initiation: First Step

- The ribosome's subunits come together at the \_\_\_\_\_ of the mRNA.
- It moves along the \_\_\_\_\_ until the A site reaches a start codon: \_\_\_\_\_.
- A tRNA with a complementary \_\_\_\_\_ enters the A site.



## Elongation: Second "Step" or Process

- The first tRNA moves to the \_\_\_\_\_.
- The tRNA with a complementary \_\_\_\_\_ to the next codon enters the \_\_\_\_\_.
- A \_\_\_\_\_ forms between the amino acid at the \_\_\_\_\_ and the amino acid at the \_\_\_\_\_.



## Where does Translation take place?

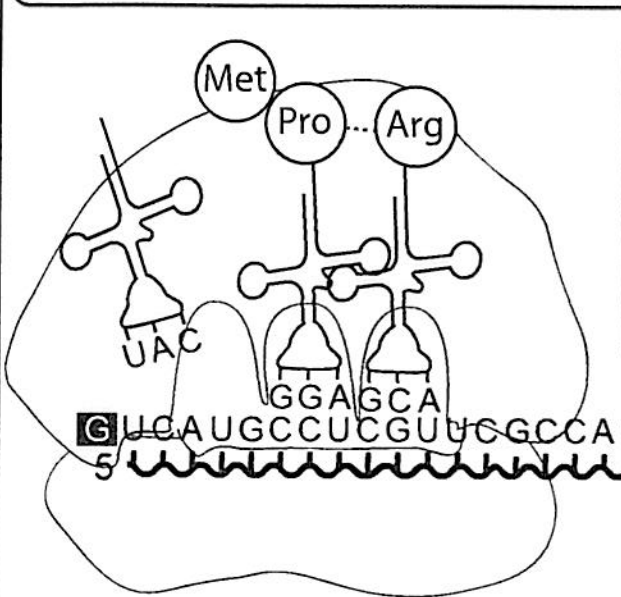
- In \_\_\_\_\_, translation takes place in the \_\_\_\_\_ where ribosomes are.
- In \_\_\_\_\_, translation can take place at the same time and place as \_\_\_\_\_, near the DNA, because there is no \_\_\_\_\_.

Name: \_\_\_\_\_

# Translation

**Elongation continued:**

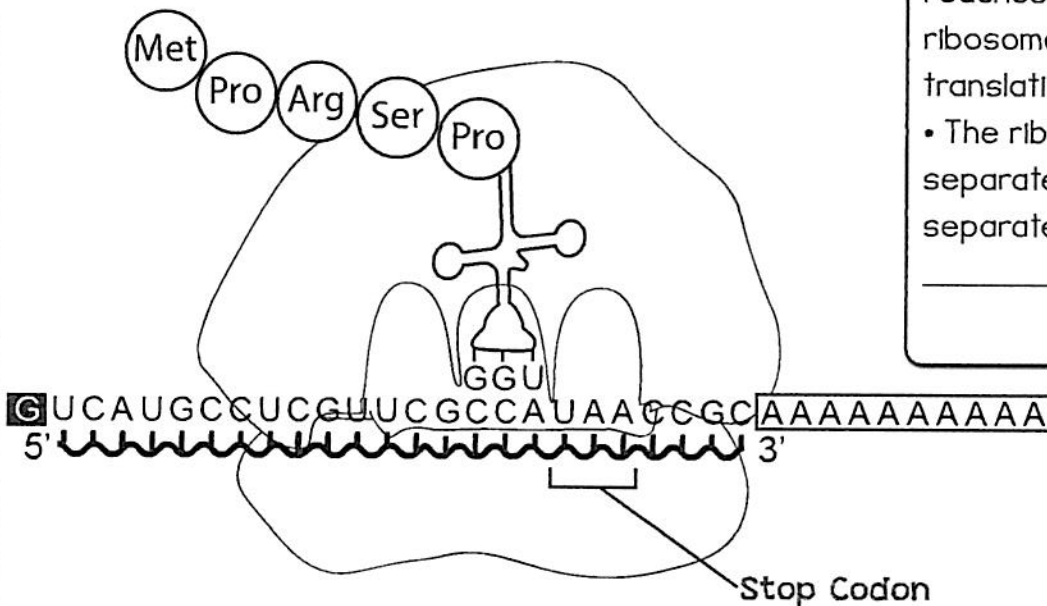
- The tRNA with the two amino acids attached moves from the \_\_\_\_\_ to the \_\_\_\_\_.
- The first tRNA that was in the P site moves to the E site and \_\_\_\_\_.



- A tRNA that is complementary to the third codon enters the \_\_\_\_\_.
- A \_\_\_\_\_ forms between the amino acids attached to the tRNAs in the A and P sites.
- This process continues until the stop codon enters the \_\_\_\_\_.

**Termination: Last Step**

- When a \_\_\_\_\_ reaches the A site, the ribosome \_\_\_\_\_ translating.
- The ribosome's \_\_\_\_\_ separate and the \_\_\_\_\_ separates from the \_\_\_\_\_ that has formed.



**What happens next?**

- The \_\_\_\_\_ can be re-used by the ribosome again!
- The \_\_\_\_\_ can also be re-used and start translating another mRNA.
- The \_\_\_\_\_ can "pick up" more matching amino acids.
- The \_\_\_\_\_ moves into the \_\_\_\_\_ for editing, processing, and sorting.