RAMA UNIVERSITY

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FACULTY OF ENGINEERING &TECHNOLOGY

DEPARTMENT OF BIOTECHNOLOGY

Translation elongation in bacteria

ongation is adding more amino acids carried by tRNA to Met (th
art amino acid.

What are the steps in translation elongation?

Amino-acyl tRNA (charged tRNA) binds to the ribosome's **A site.**

Peptide bond forms.

Ribosome moves (translocate) one codon downstream.

What is needed for elongation?

.Charged tRNA

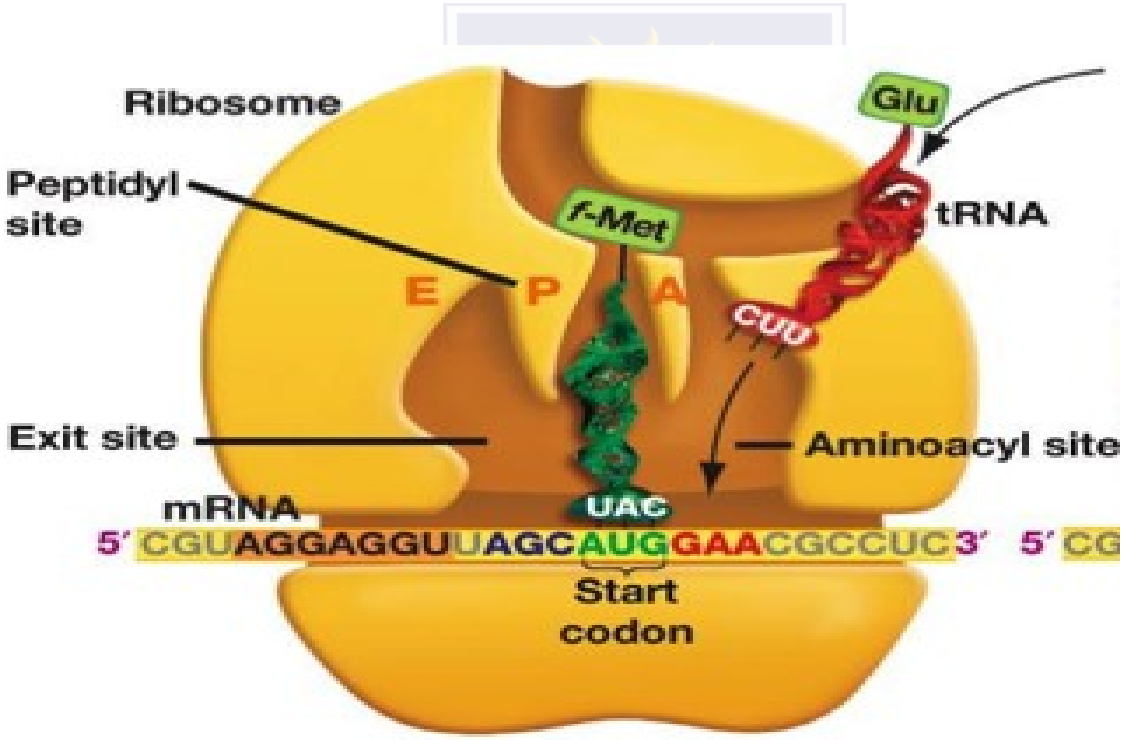
.Elongation factors (EF)

.GTP

ongation process:

fMet tRNA is bound to the AUG codon at P site. 2.Next codon

positioned in the A site.

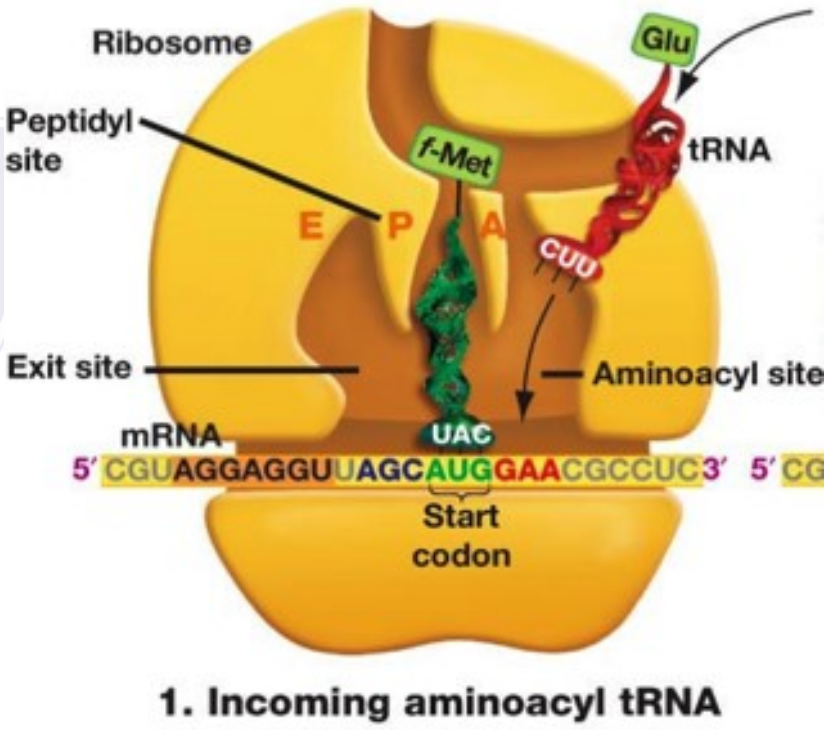


1. Incoming aminoacyl tRNA

Elongation process:

3.Appropriate amino-acyl tRNA binds to the Asite.

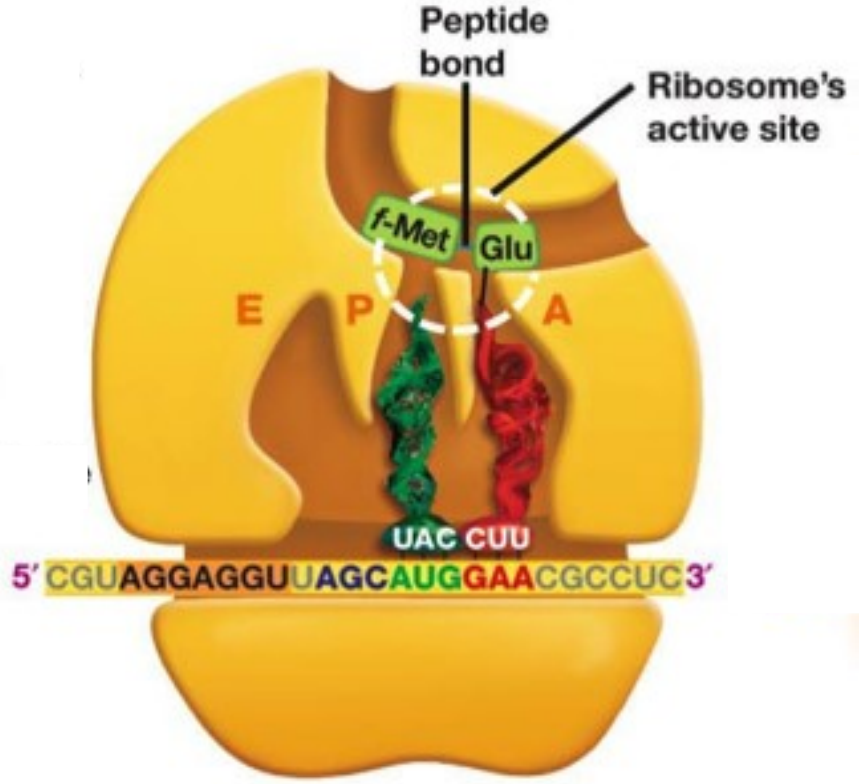
4.The charged tRNA is brought to the ribosome by **elongation factors (EF and GTP)**.



Elongation process:

5.Two amino-acyl tRNAs are in positions P and A and a peptide bond is formed between the two amino acids.

6.The bond between the amino acid and tRNA at P site is broken.

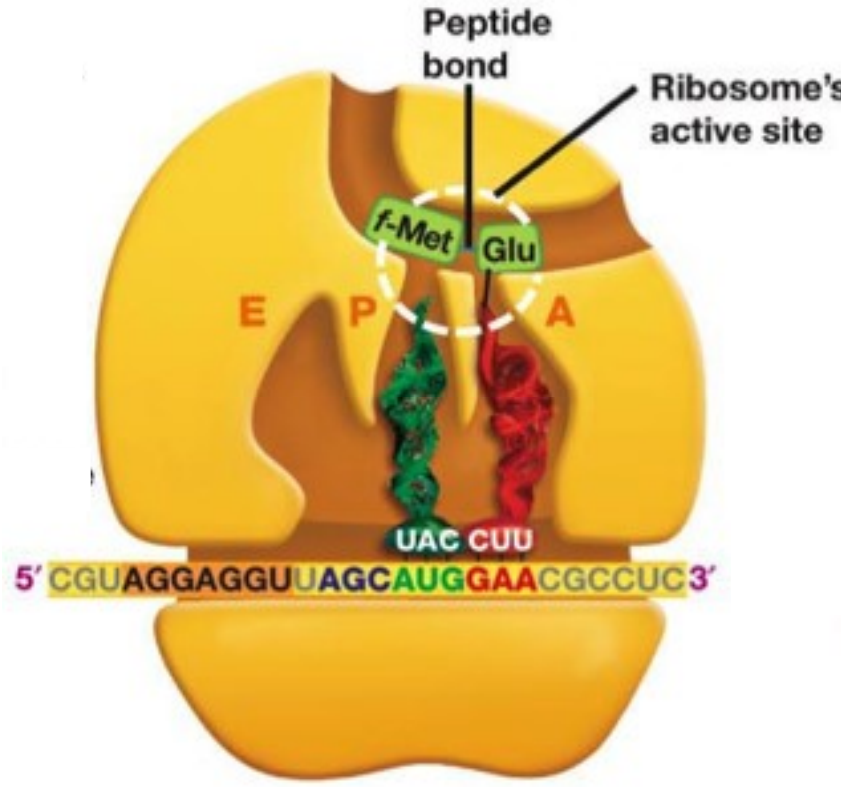


2. Peptide bond formation

ongation process:

A peptide bond is formed
tween the free amino acid
m the P site and the one
the A site by:

- **Peptidyl Transferase**

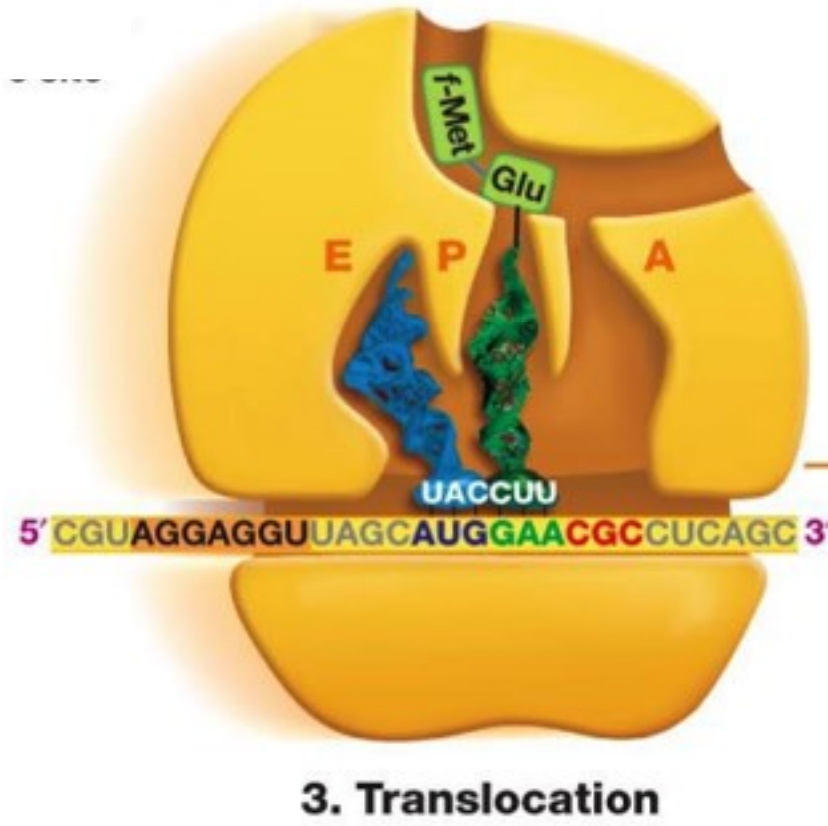


2. Peptide bond formation

ongation process:

When a peptide bond is med the free tRNA is in e P and the tRNA at site has two amino acids.

Ribosome moves one don downstream (3').

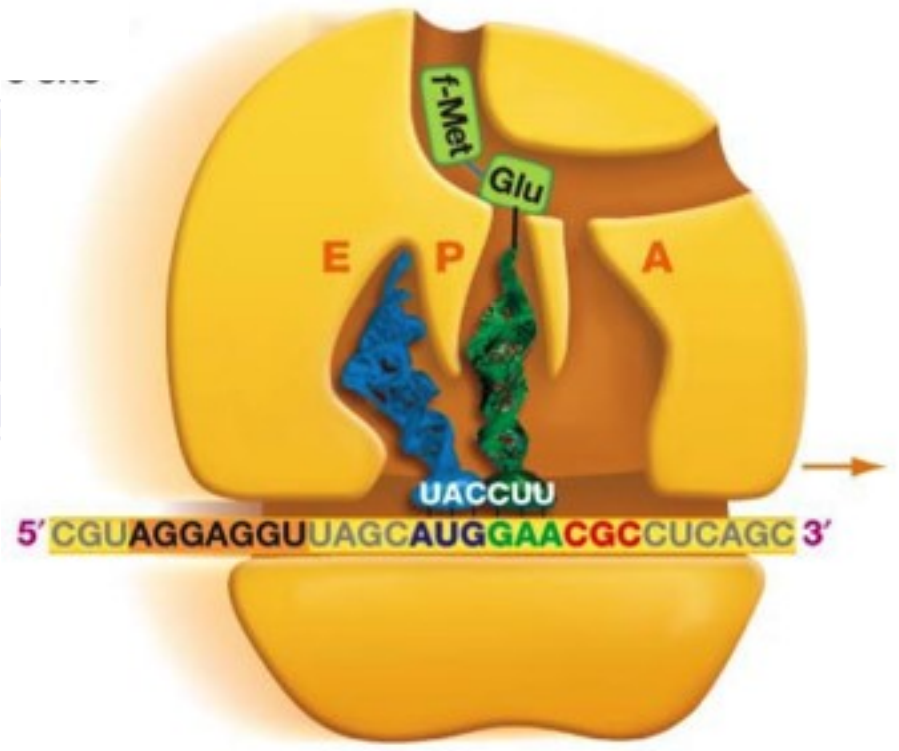


3. Translocation

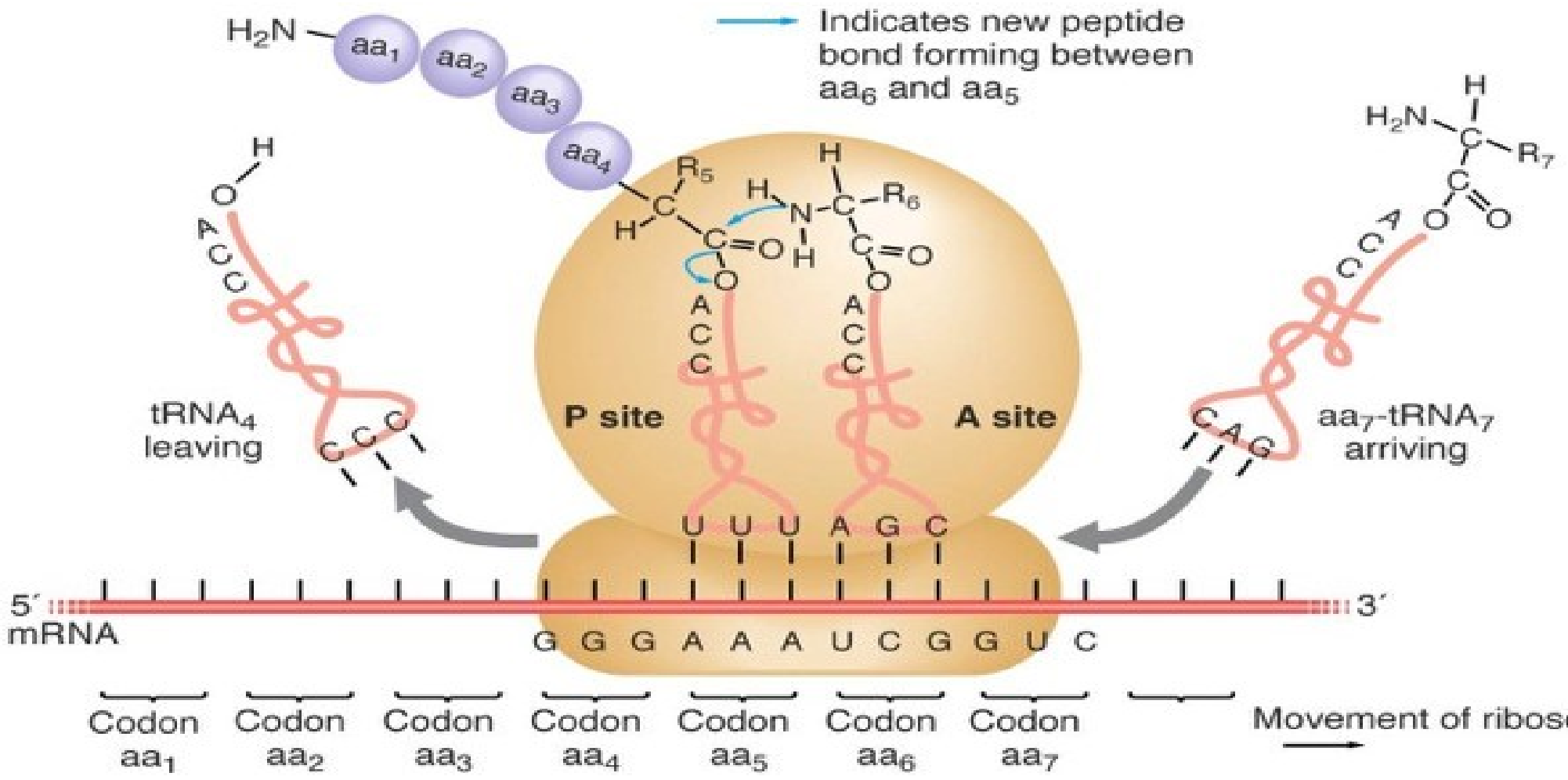
ongation process:

.Free tRNA moves to
e E site.

.A new charged tRNA
ts to the A site and the
cle repeats.



3. Translocation


Indicates new peptide bond forming between aa6 and aa5
H2N
aa1
aa2
aa3
aa4
tRNA4 leaving
P site
A site
aa7-tRNA7 arriving
U U U A G C
5′
mRNA
3′
G G G A A A U C G G U C
Codon aa1
Codon aa2
Codon aa3
Codon aa4
Codon aa5
Codon aa6
Codon aa7
Movement of ribosomes

NGATION OF POLYPEPTIDES DURING TRANSLATION

ncoming aminoacyl tRNA
tRNA moves into A site, where
nticodon base pairs with the
IA codon.

2. Peptide bond formation
The amino acid attached to the tRNA in the P site is transferred to the tRNA in the A site.

3. Translocation
Ribosome moves down mRNA. T
tRNA attached to polypeptide ch
moves into P site. The A site is en

Incoming aminoacyl tRNA
w tRNA moves into A site, where anticodon base pairs with the NA codon.

5. Peptide bond formation
The polypeptide chain attached to the tRNA in the P site is transferred to the tRNA in the A site.

6. Translocation
Ribosome moves down mRNA. Tl tRNA attached to polypeptide ch moves into P site. Empty tRNA fr P site moves to E site, where tRN ejected. The A site is empty again