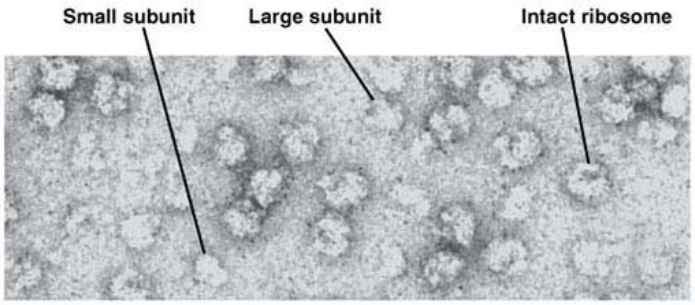
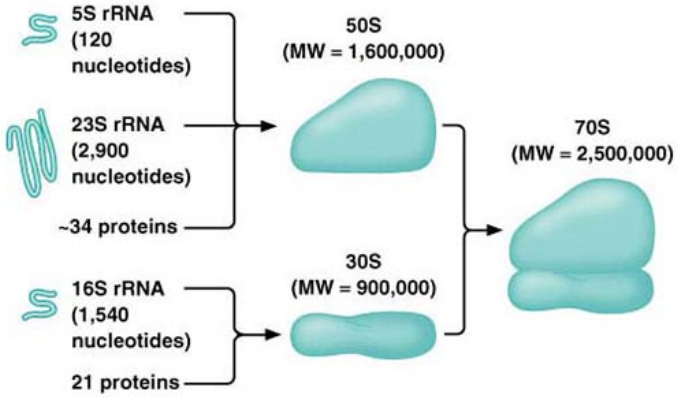
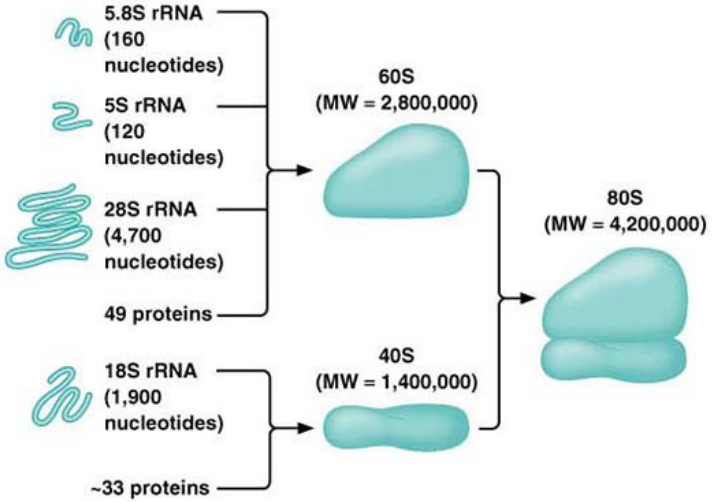


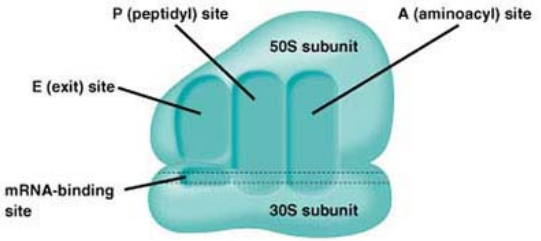
(a) Bacterial ribosomes and free subunits



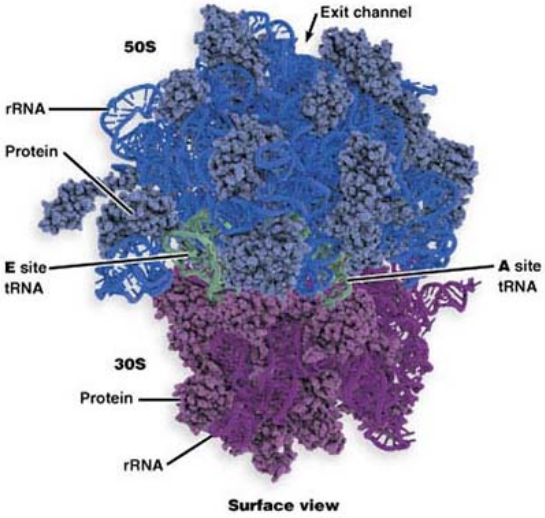
(b) Bacterial ribosome



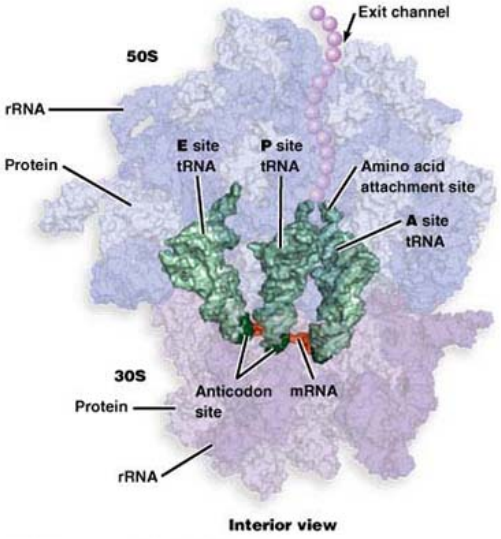
(c) Eukaryotic ribosome



(a) Diagram of a bacterial ribosome

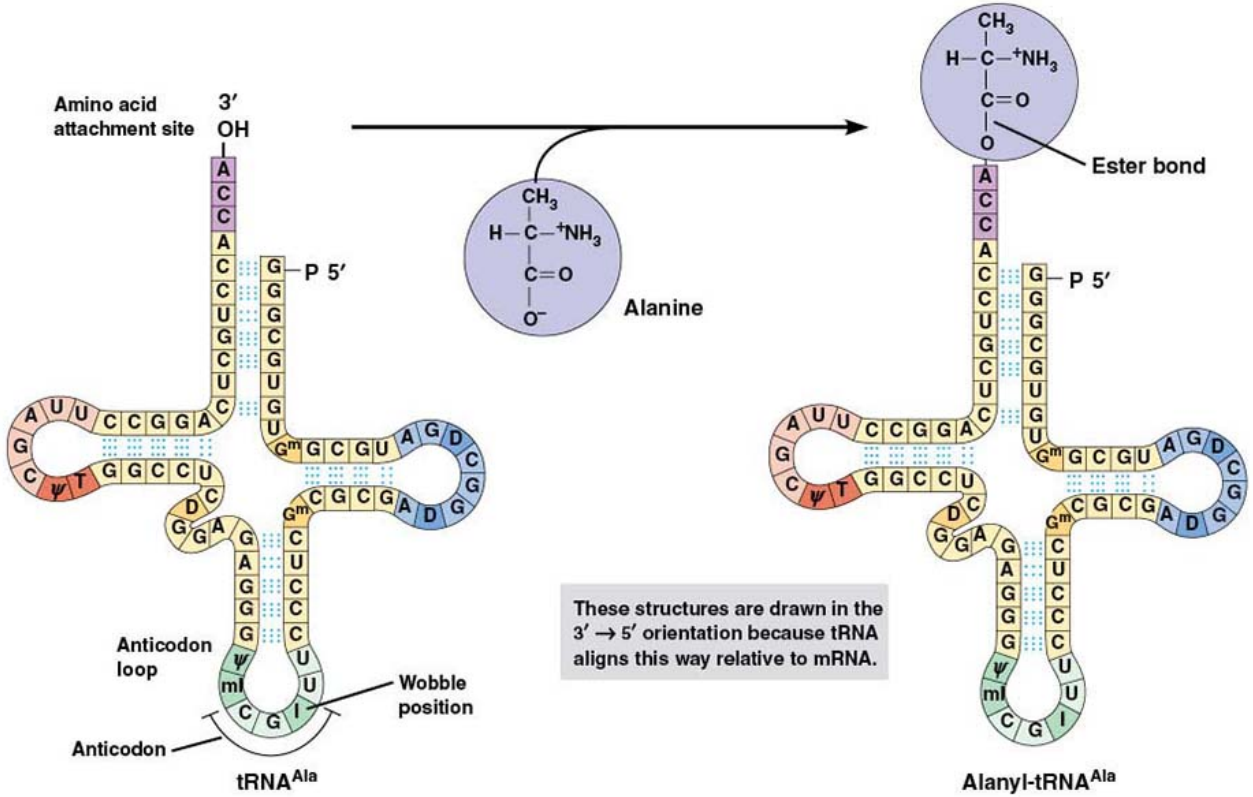


Surface view

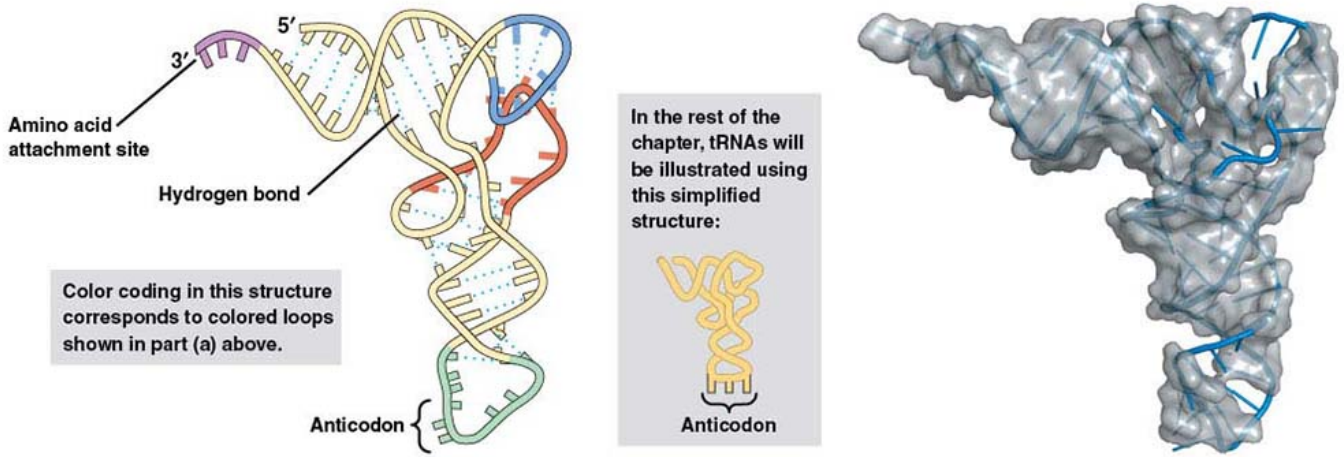


Interior view

(b) Molecular model of a bacterial ribosome

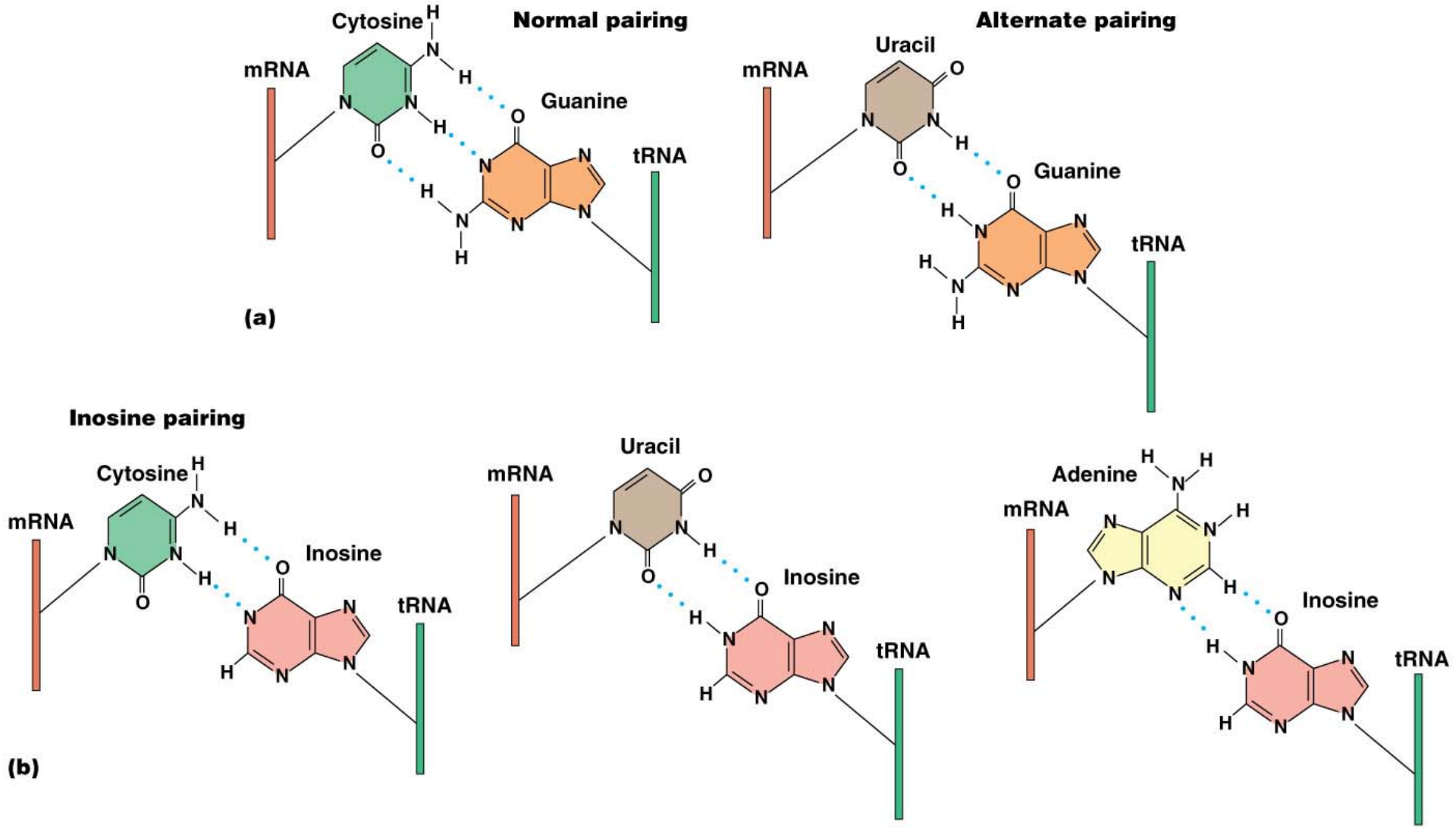


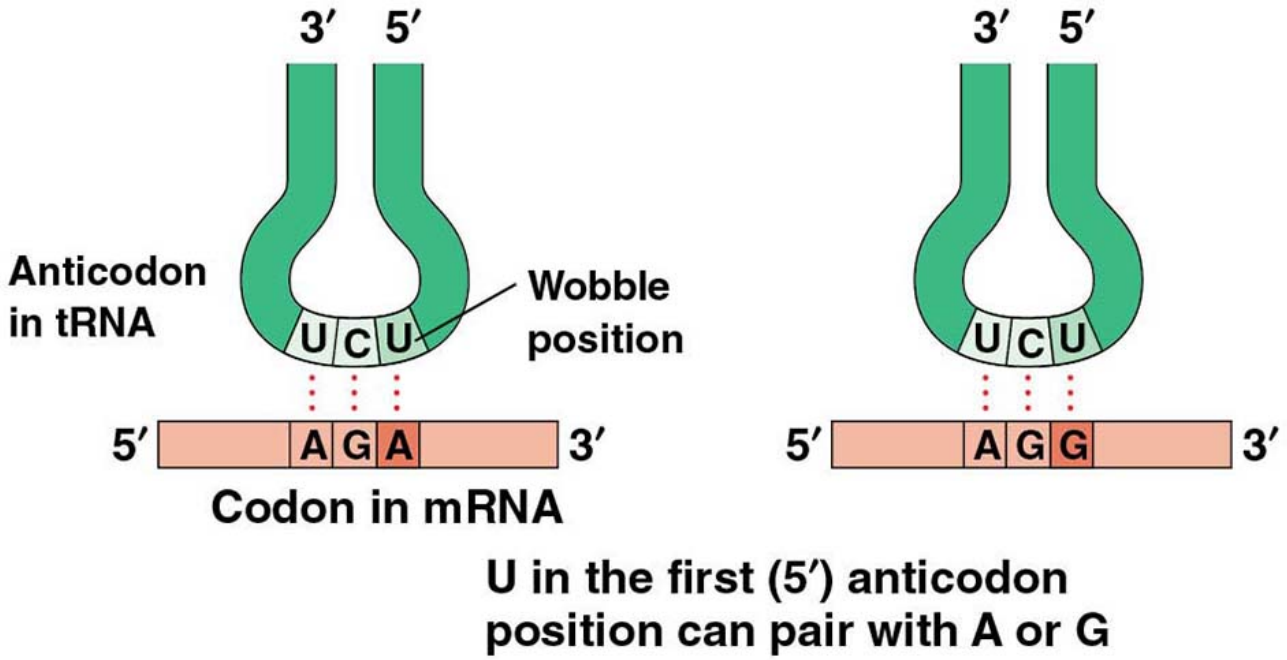
(a) Secondary structure of tRNA, before and after amino acid attachment



(b) Tertiary structure of tRNA

(c) Molecular model of phenylalanine tRNA

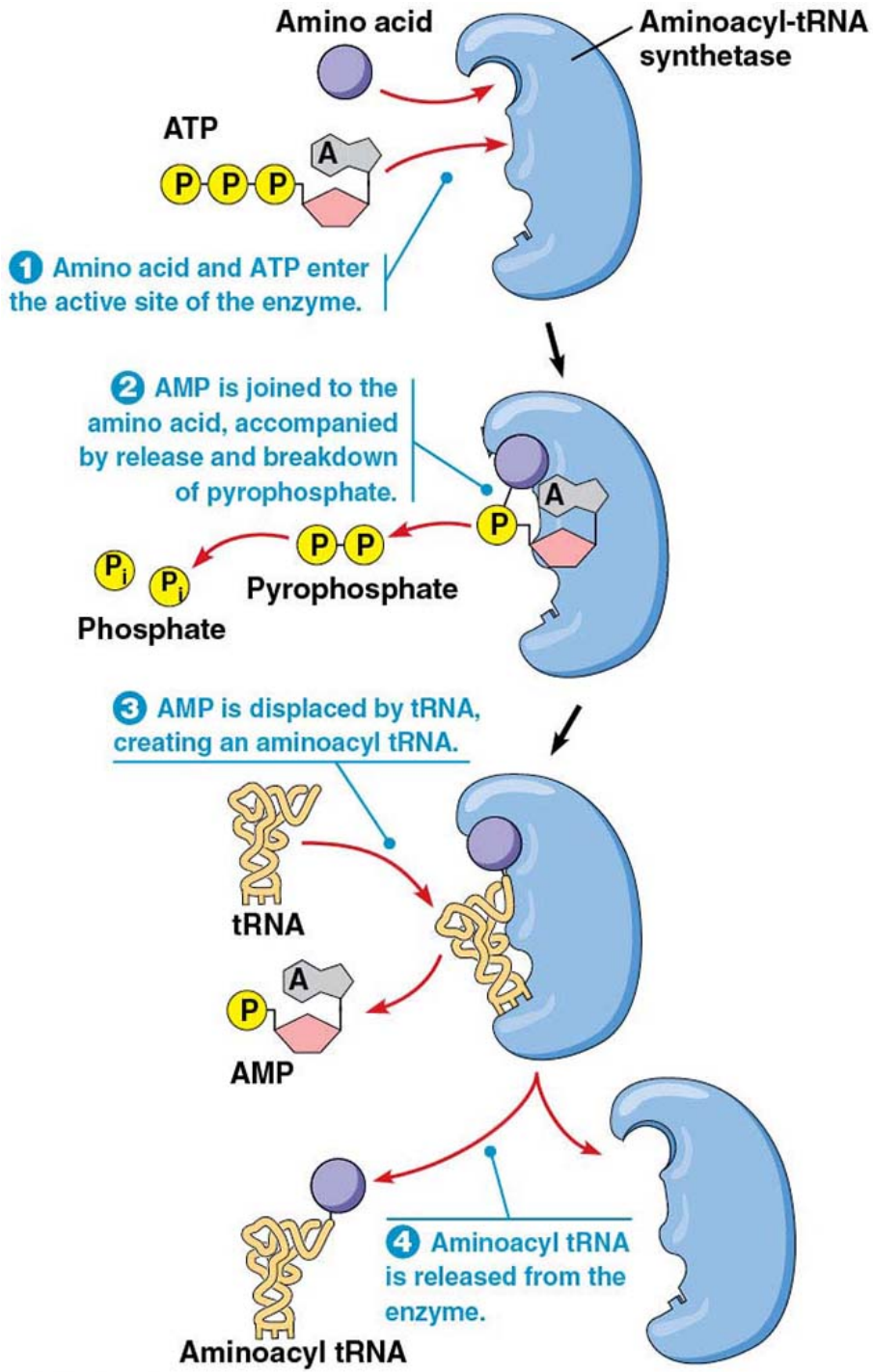


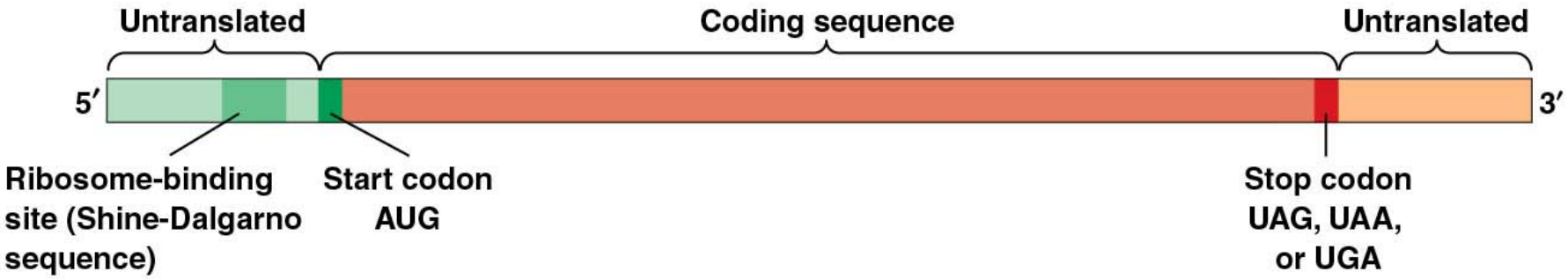


(a)

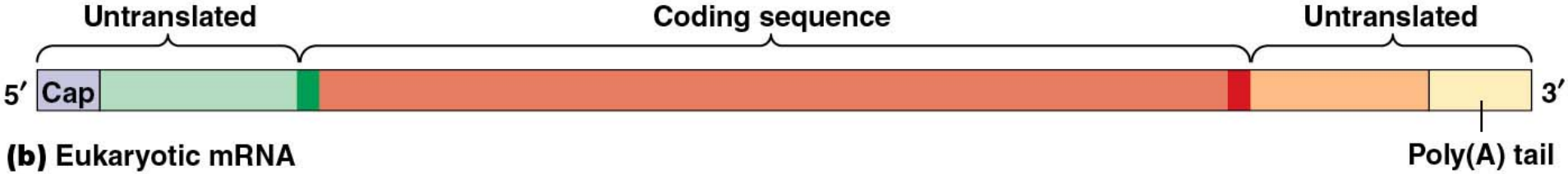
Bases Recognized in Codon (third position only)	Base in Anticodon
U	A
G	C
A or G	U
C or U	G
U, C, or A	I (Inosine)

(b)

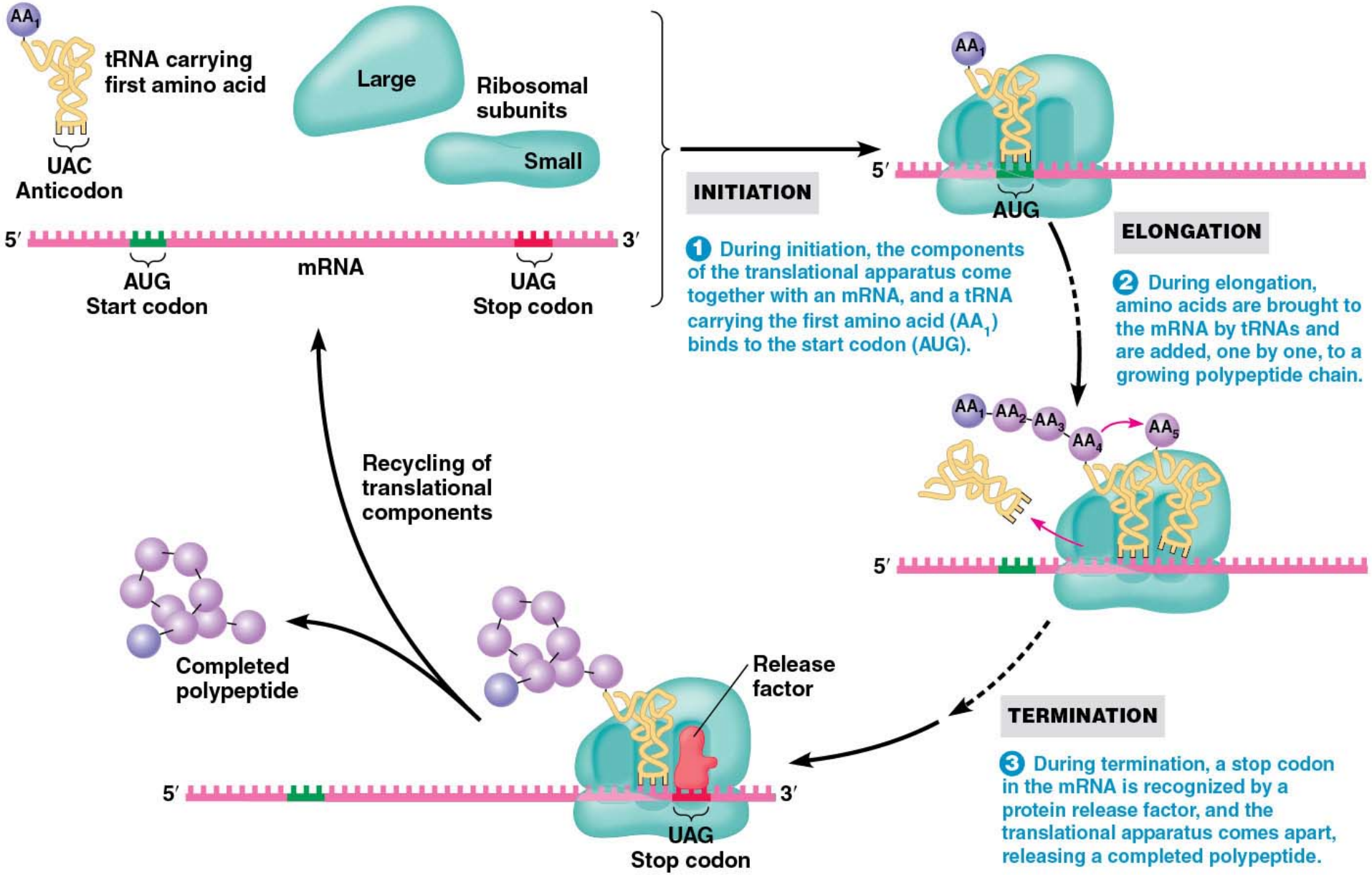


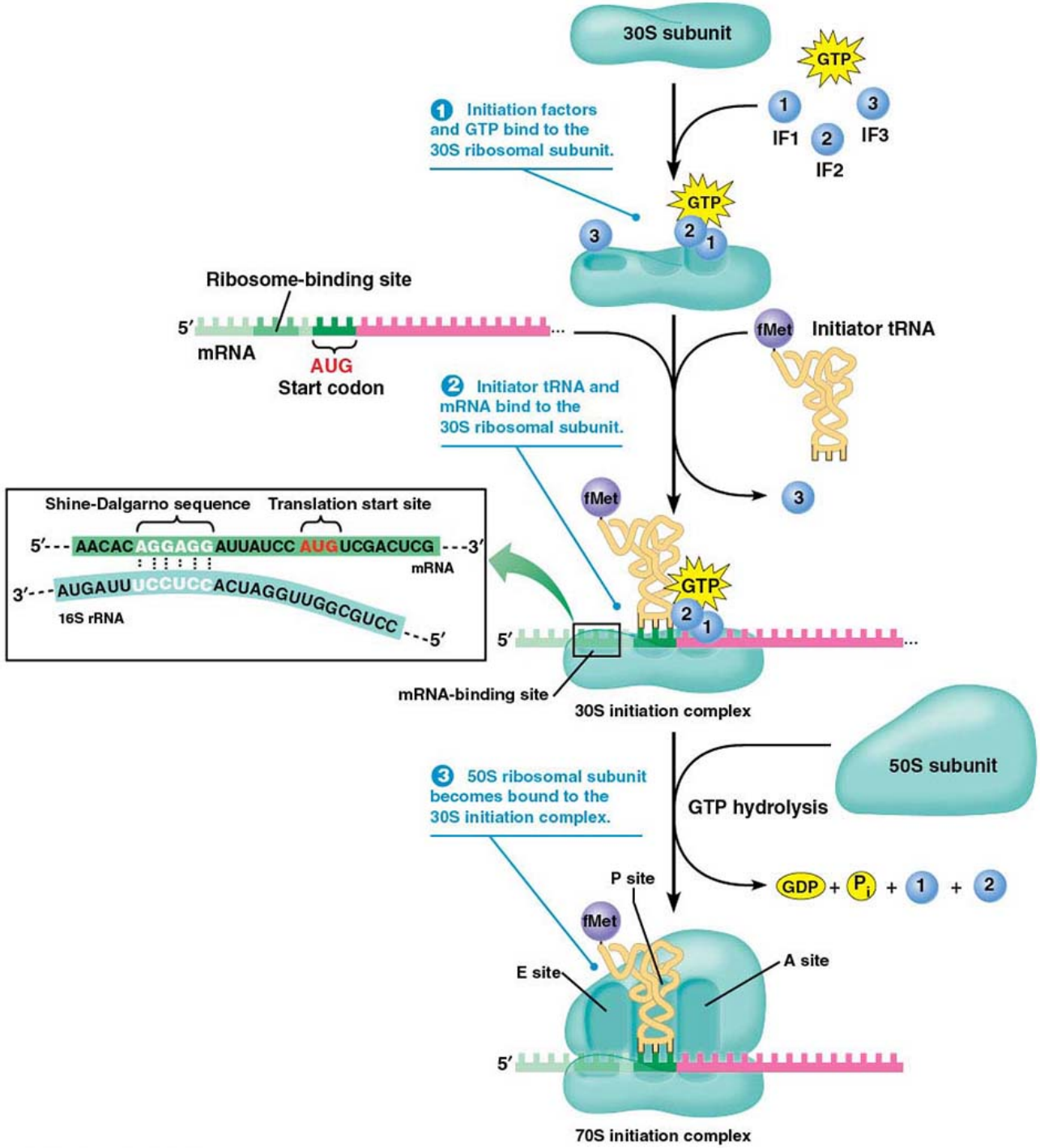


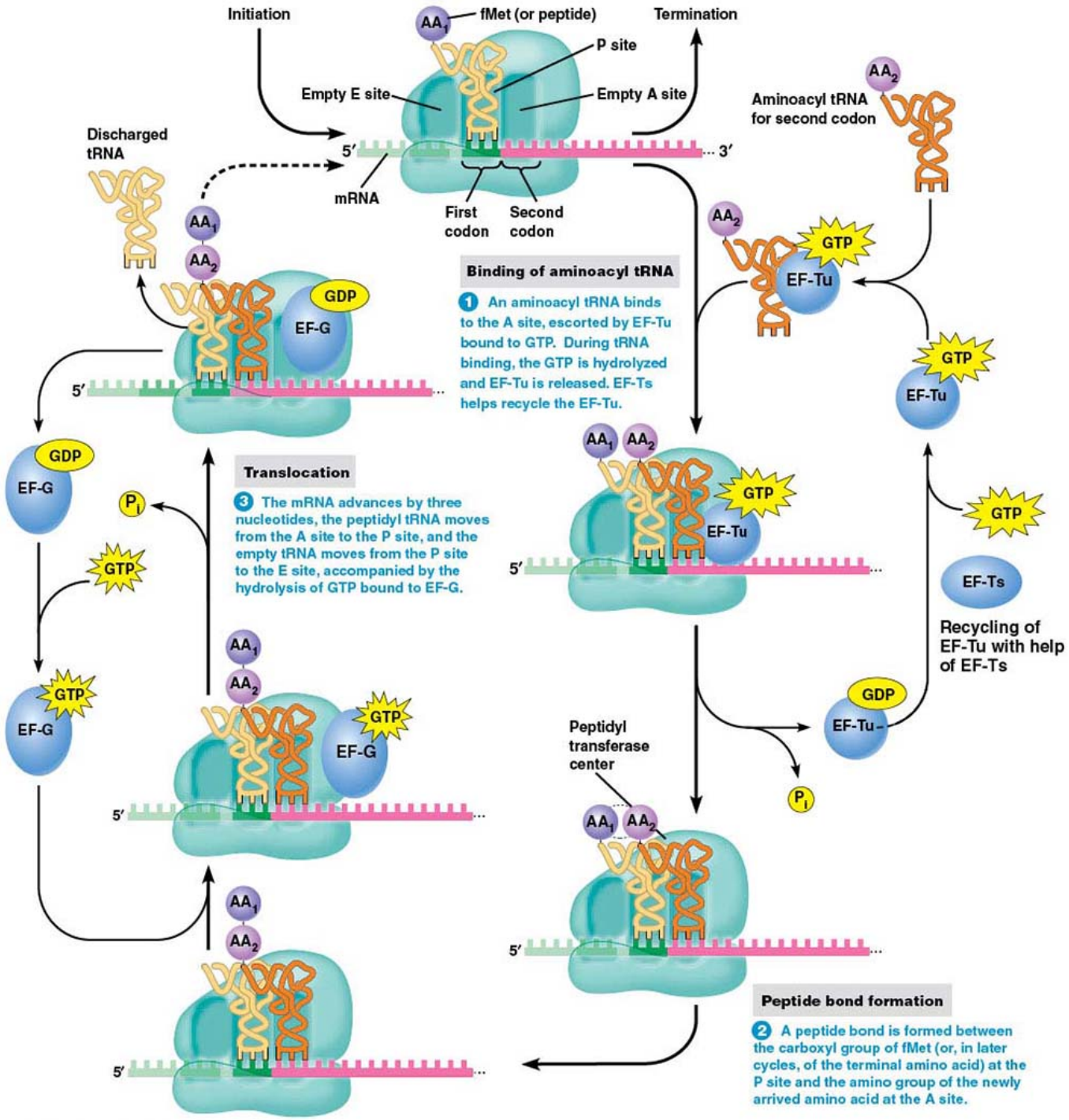
(a) Prokaryotic mRNA

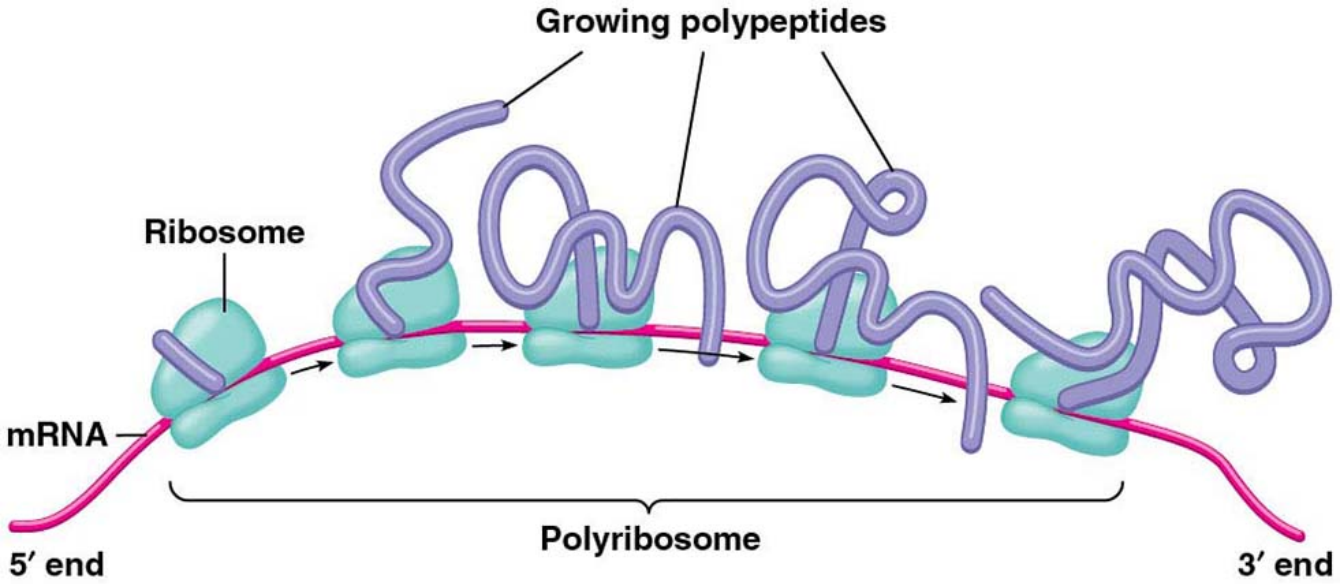


(b) Eukaryotic mRNA

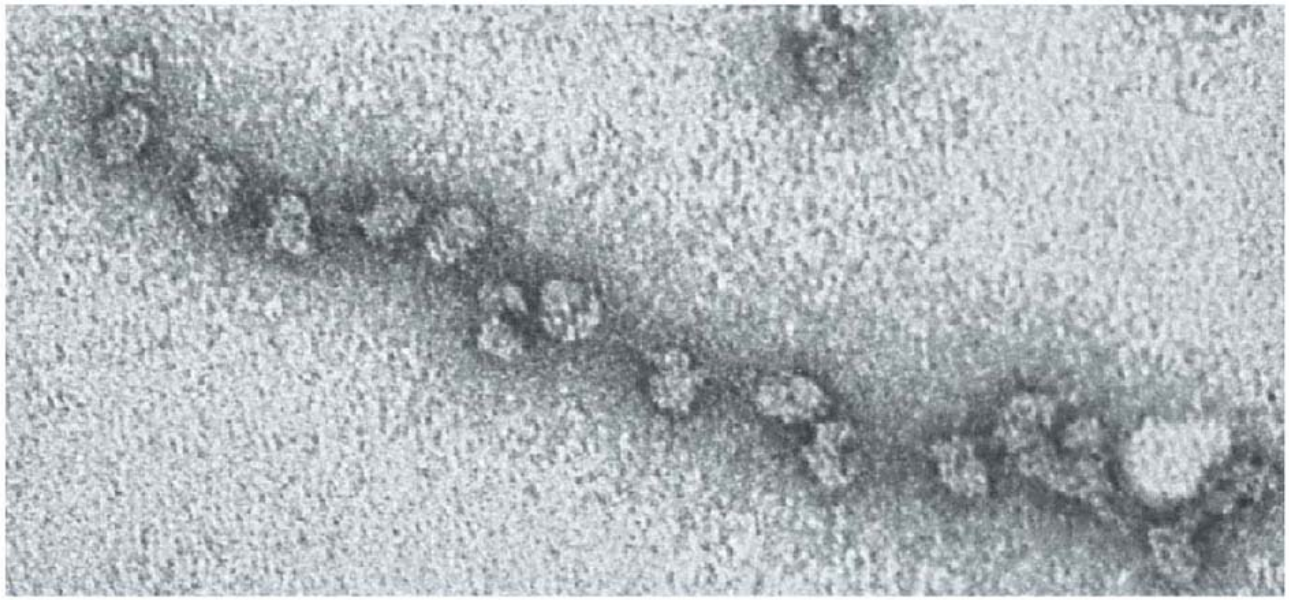




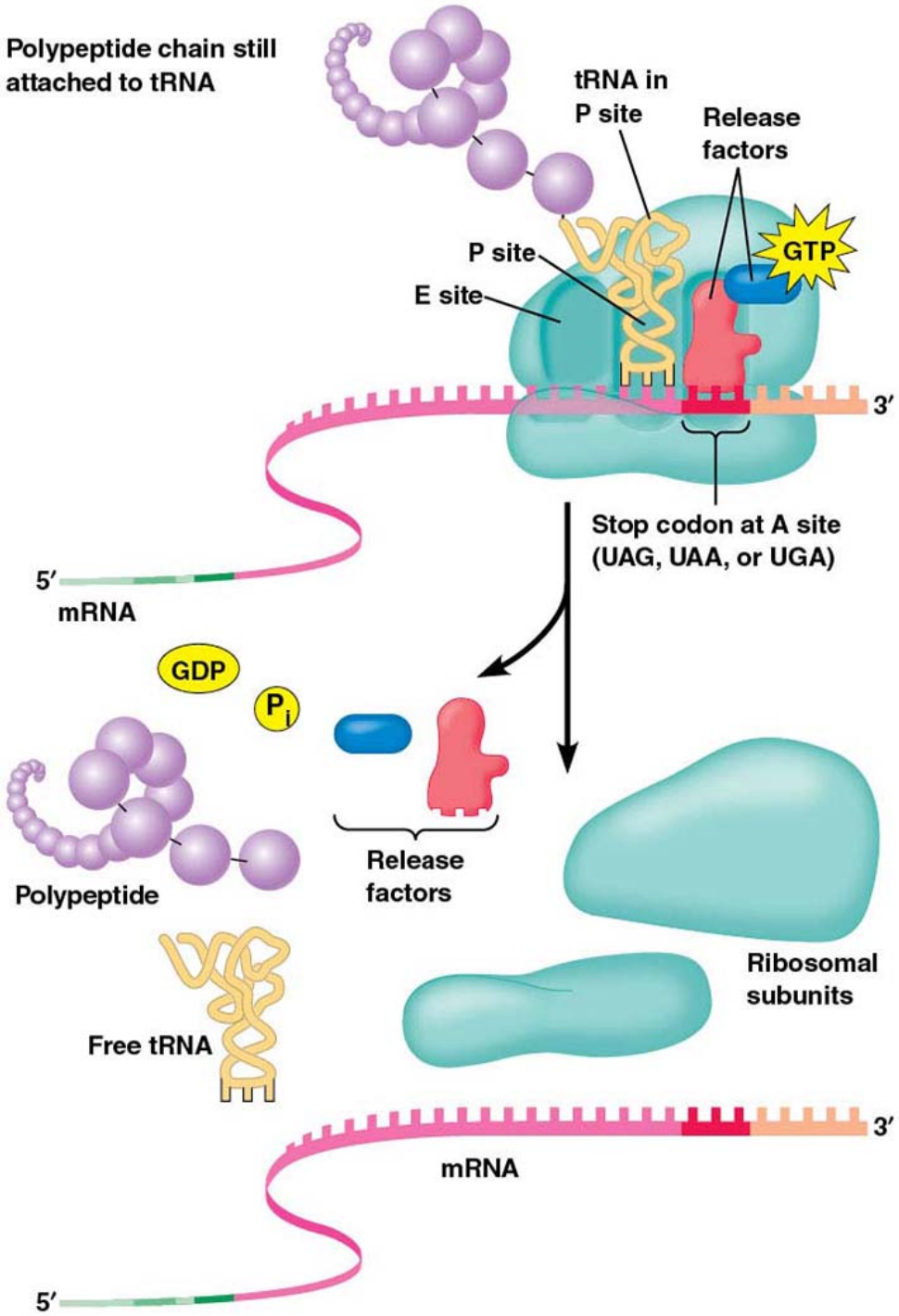


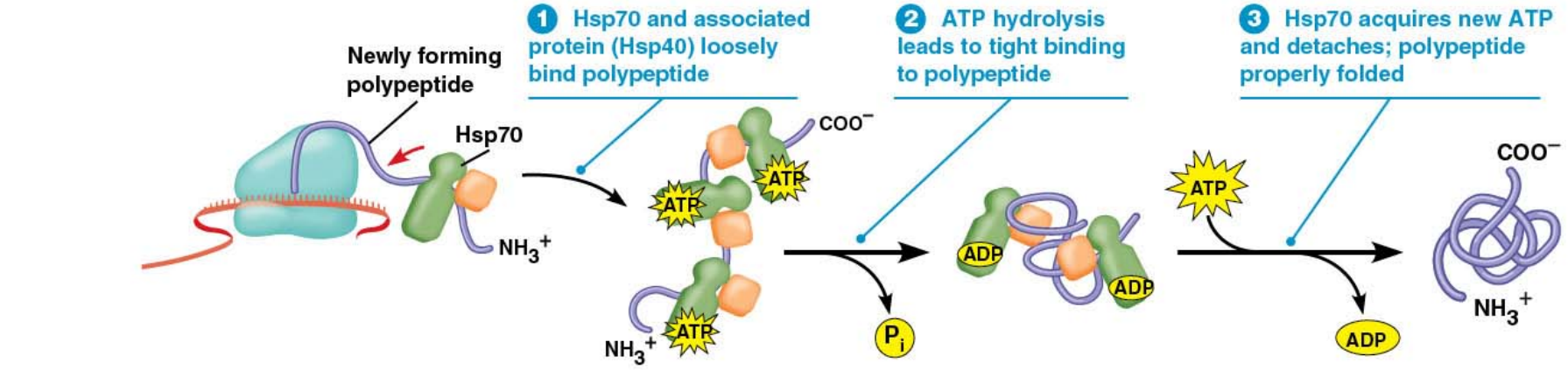


(a)

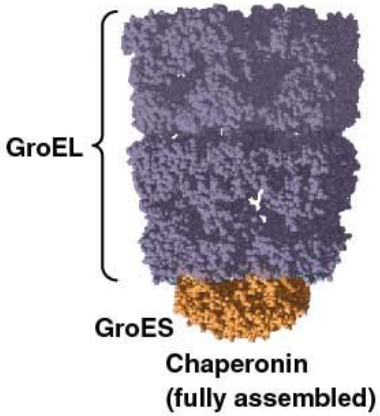


(b)



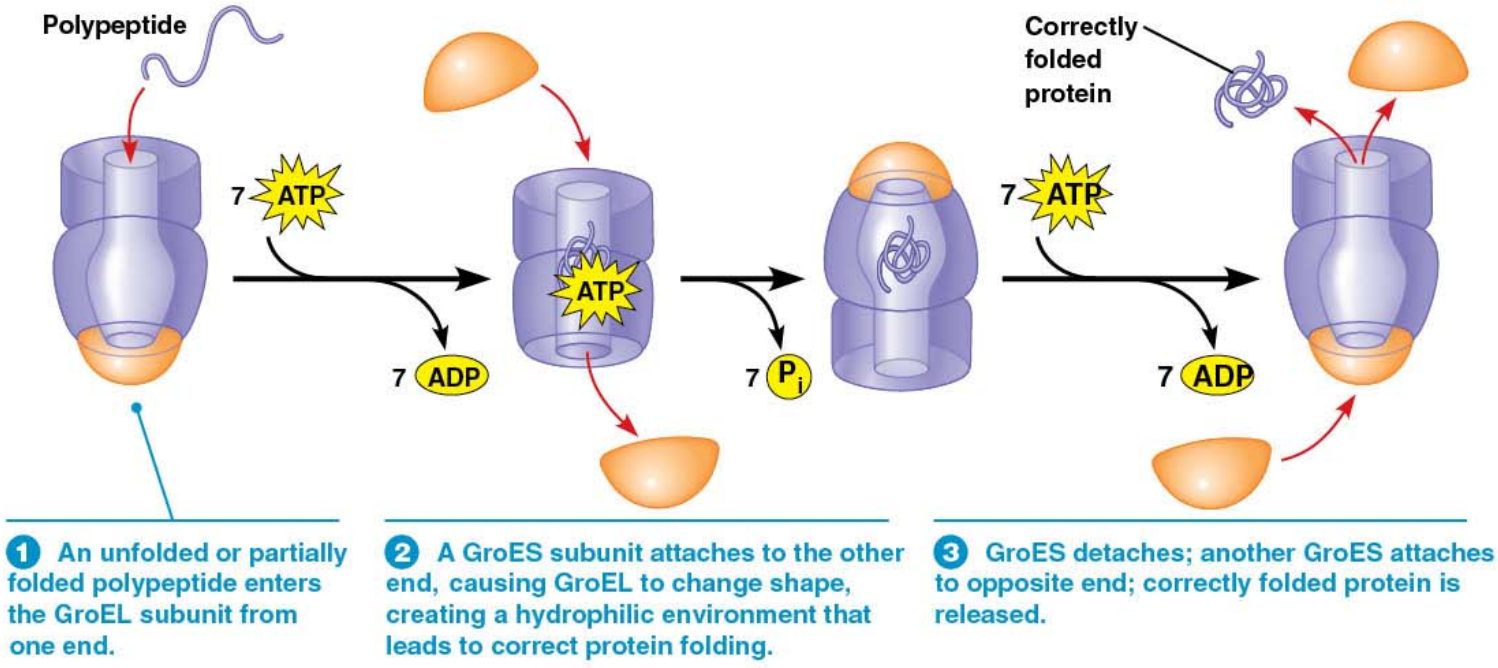


(a) Folding aided by Hsp70 protein

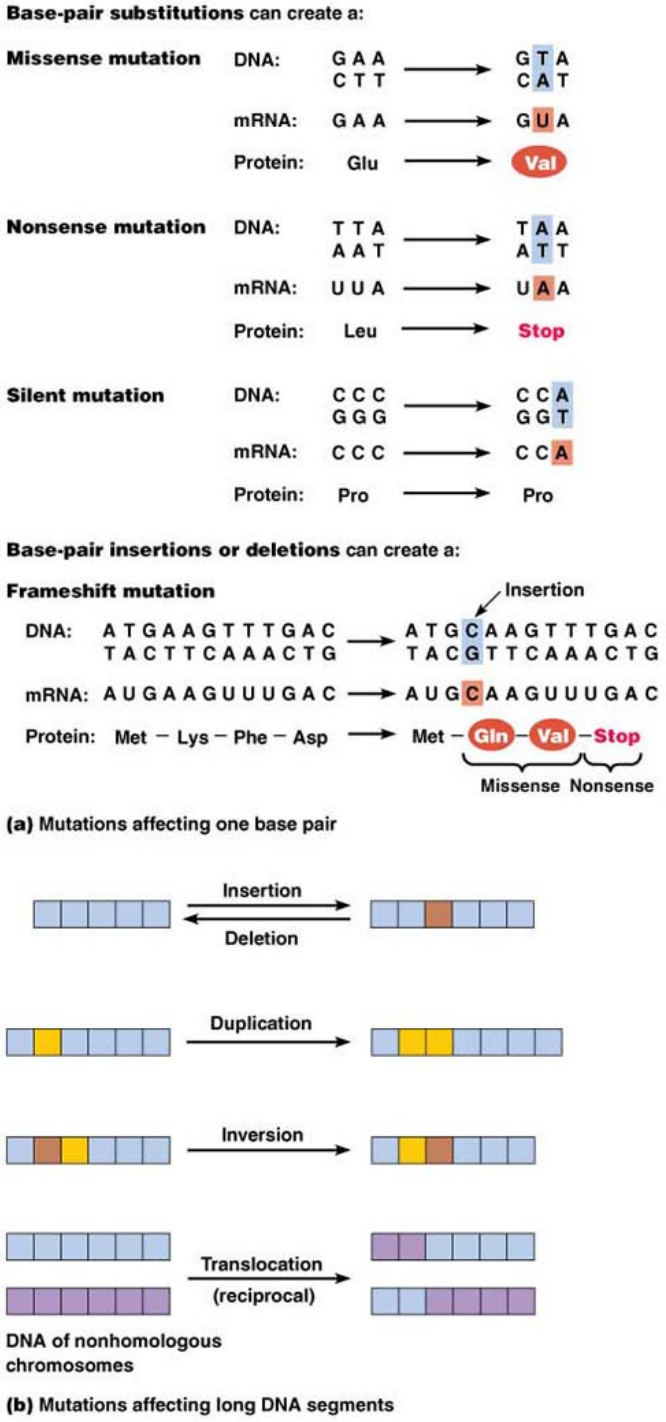


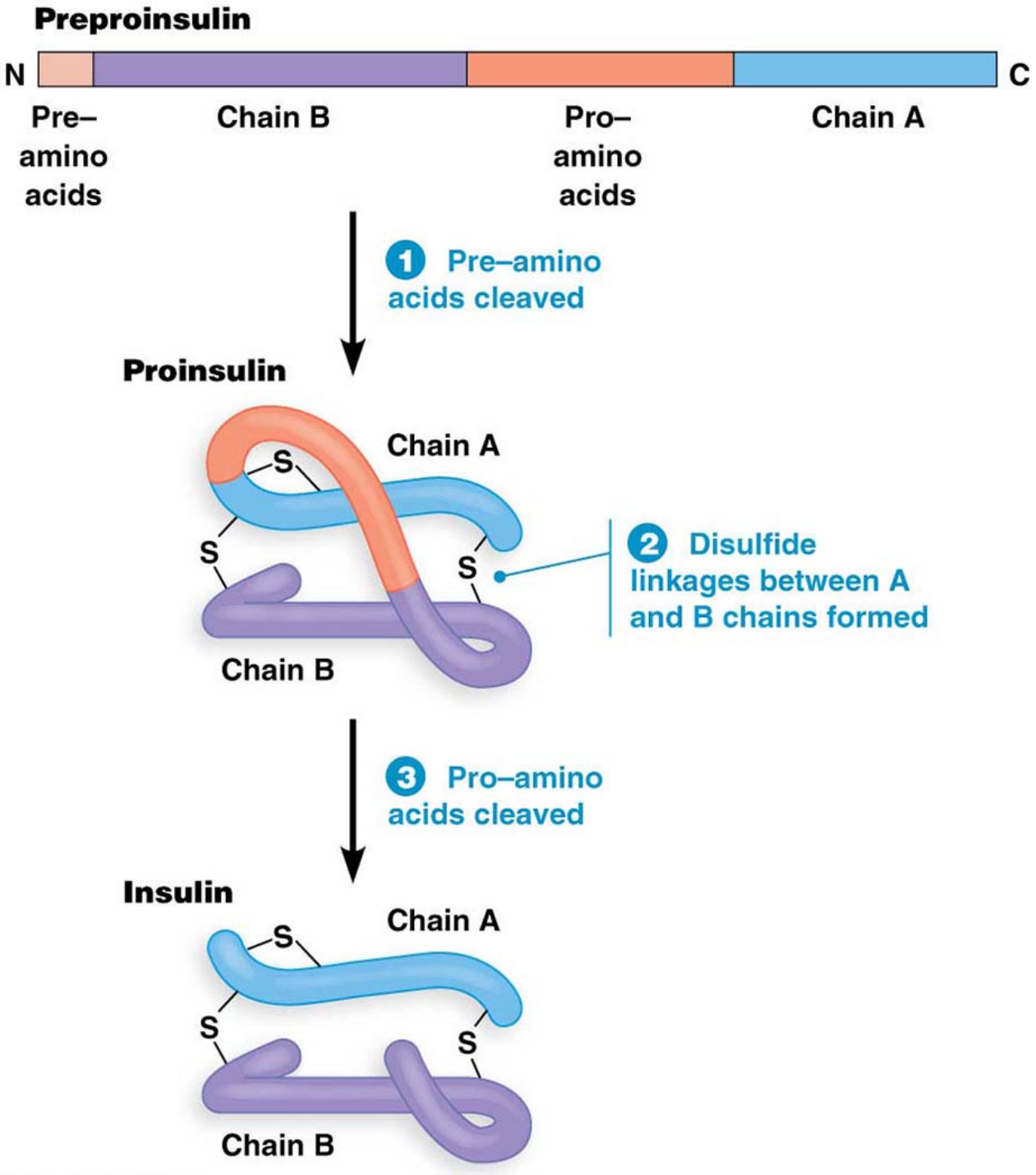
Chaperonin (fully assembled)

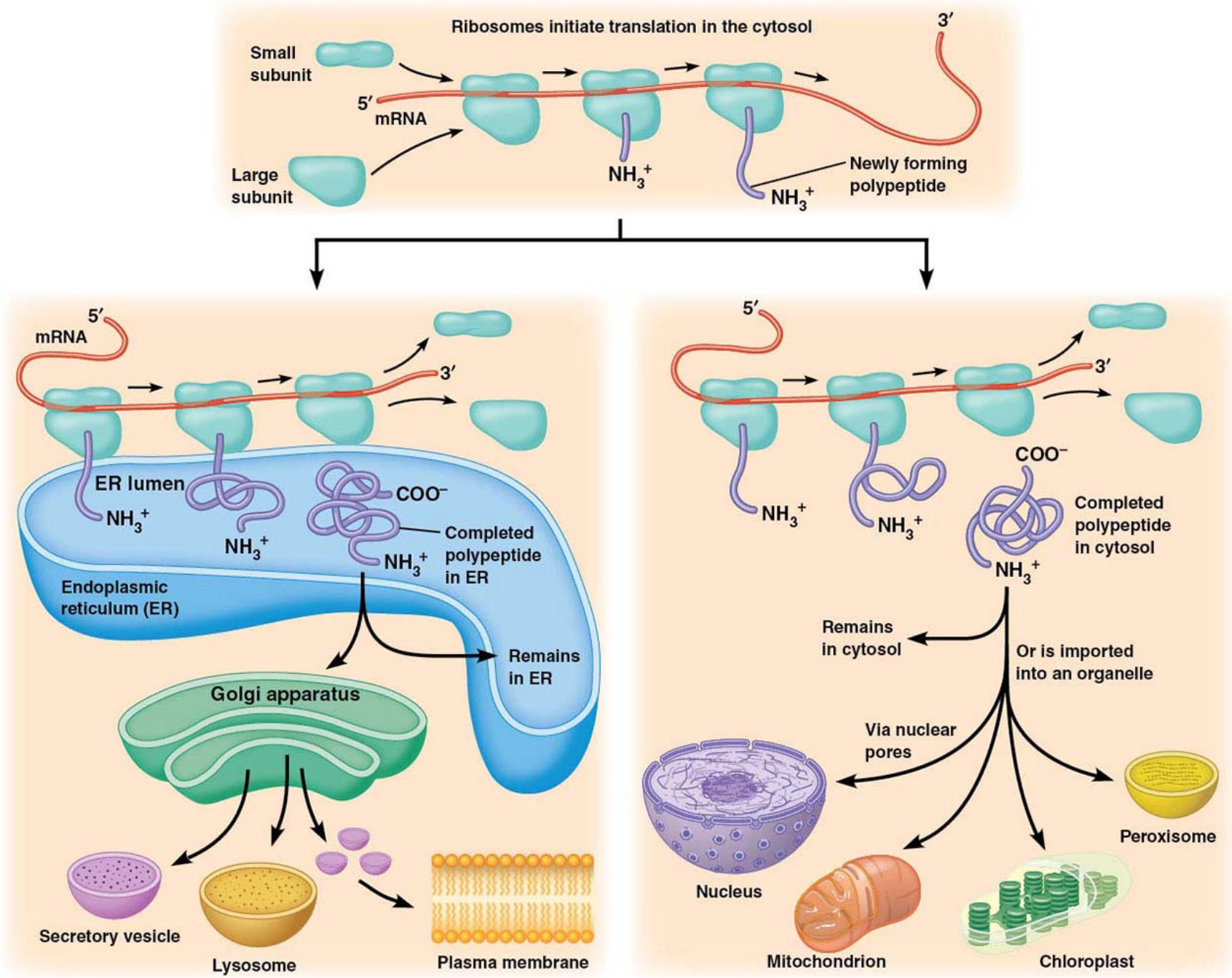
(b) Hsp60 chaperonin structure



(c) Folding aided by Hsp60

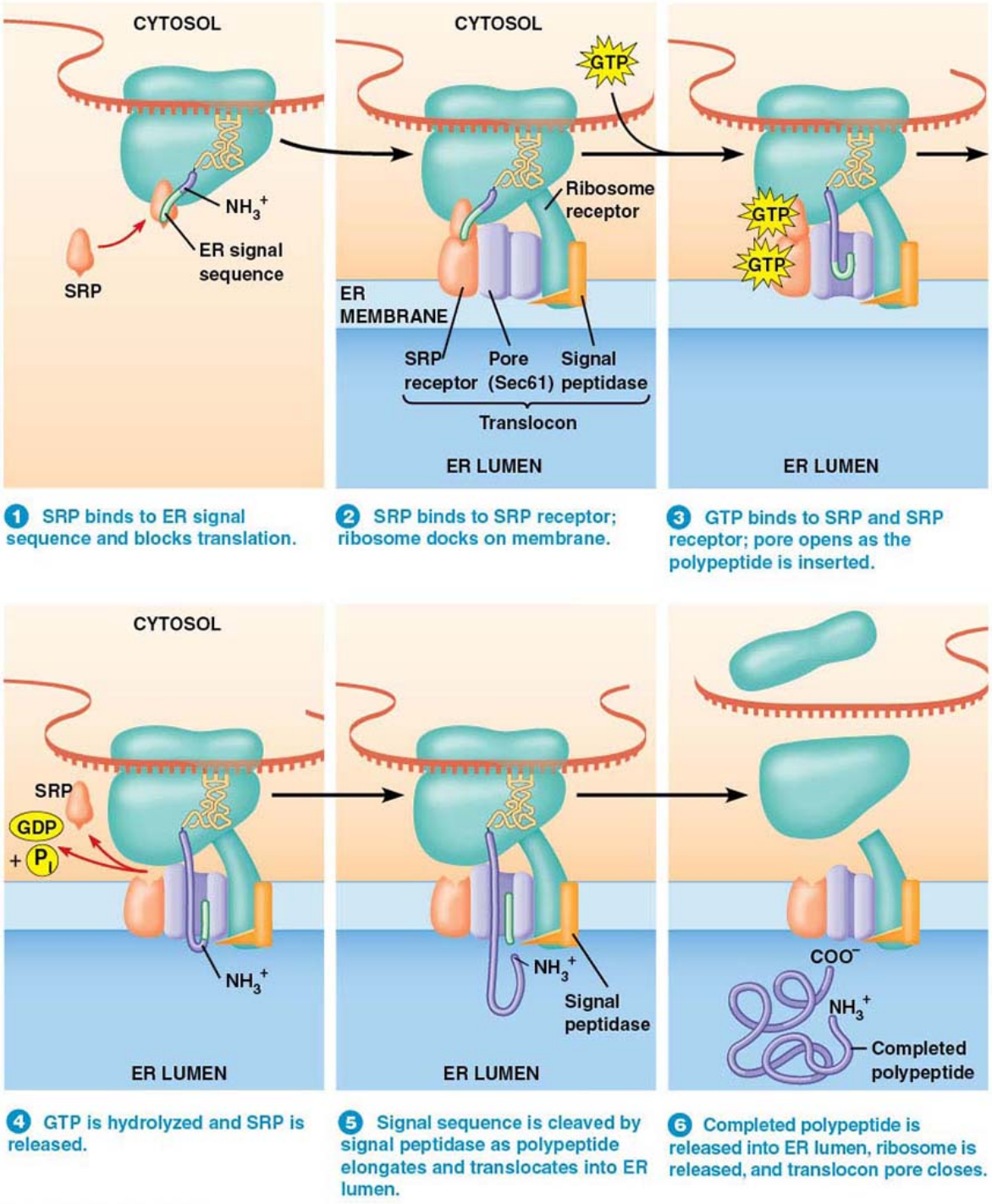




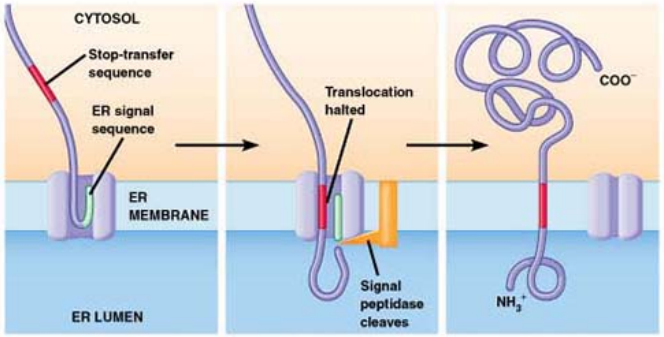


(a) COTRANSLATIONAL IMPORT

(b) POSTTRANSLATIONAL IMPORT



(a) Type I transmembrane protein: Internal stop-transfer sequence and terminal ER signal sequence

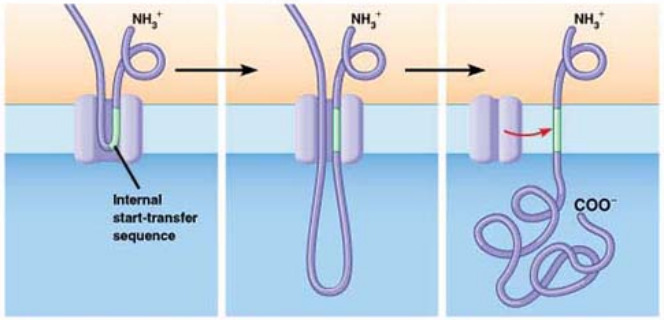


1 Signal sequence targets polypeptide to translocon.

2 Stop transfer sequence halts translocation; signal sequence removed.

3 Protein released laterally into ER membrane. N terminus is in ER lumen; C terminus is in cytosol.

(b) Type II transmembrane protein: Polypeptide with single internal start-transfer sequence

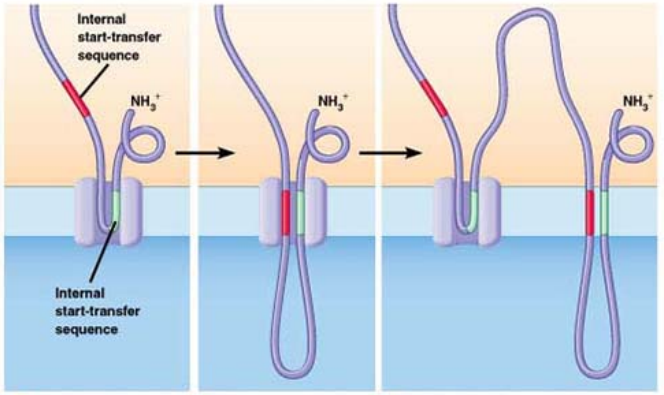


1 Start-transfer sequence starts polypeptide transfer.

2 Protein continues translocation until the C terminus moves through translocon.

3 Protein is released laterally into ER membrane.

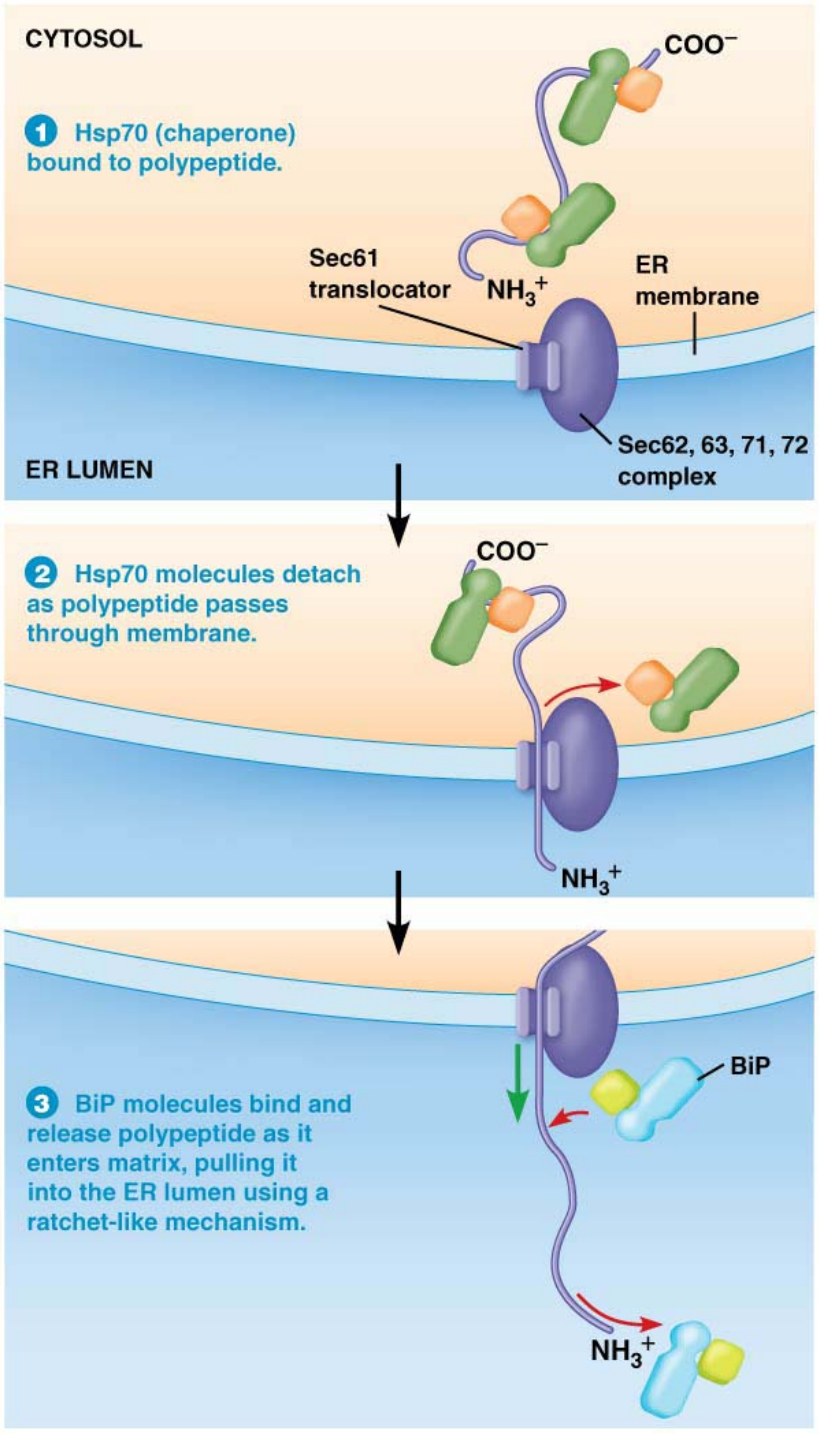
(c) Multi-pass transmembrane protein: Multiple internal start- and stop-transfer sequences

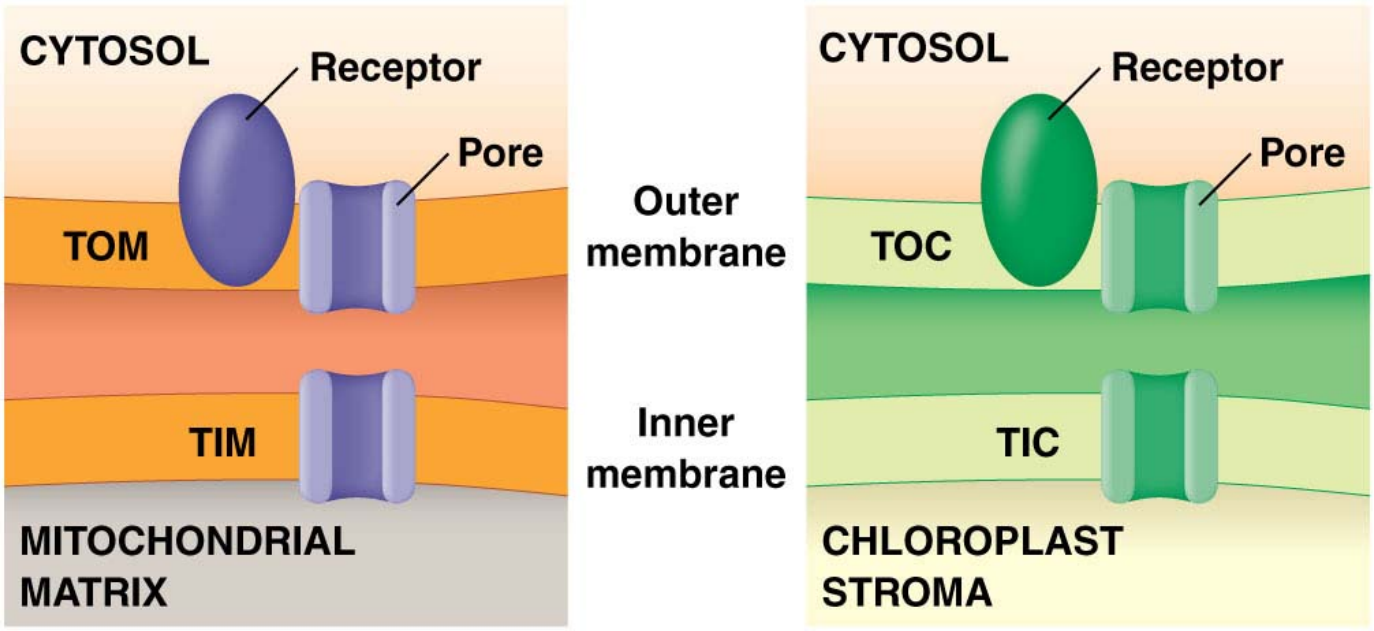


1 Start-transfer sequence starts polypeptide transfer.

2 Protein continues translocation until stop-transfer sequence is encountered.

3 Portion of protein is released laterally into ER membrane. Next start-transfer sequence repeats process to initiate a second transmembrane region.





Mitochondrion **Chloroplast**