EXPRESIÓN GÉNICA Y SU REGULACIÓN

- Transcripción del ADN

TRANSCRIPCIÓN

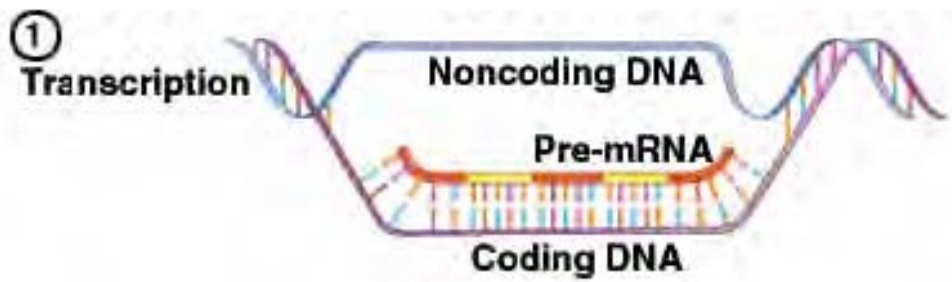
•¿Qué es?

Es la copia del RNA a partir del DNA (*se transcribe*)

•¿Cómo se realiza?

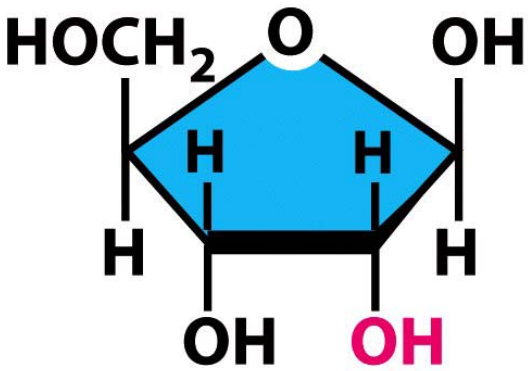
A través de polimerasas de RNA, cuyas funciones son:

- Decidir dónde unirse al DNA
- Abrir la doble hebra de DNA
- Copiar las bases de una de las hebras del DNA a una molécula de pre-mRNA
- Cerrar la doble hebra del DNA

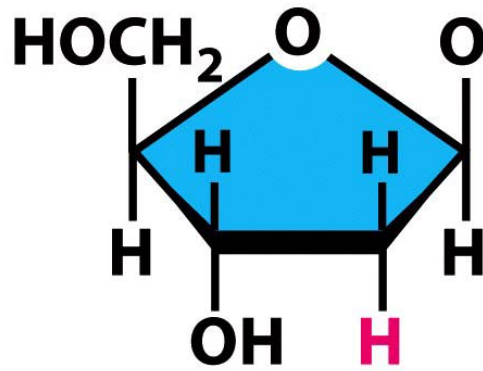


RNA

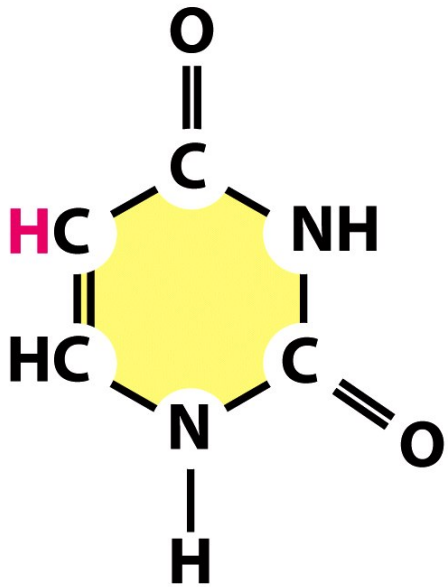
- Una cadena
- Más pequeño
  - ARNt (tRNA)
  - ARNm (mRNA
  - ADN por sobr
- Ribosa en vez
- Uracilo en lug
  nitrogenada
- Funciones:
  - interpretar el có
  - Dirigir la síntesi



ribose

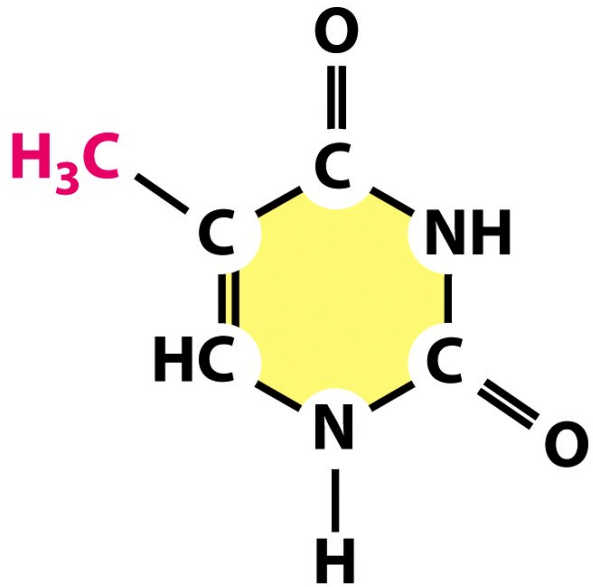


deoxyribose



uracil

used in RNA

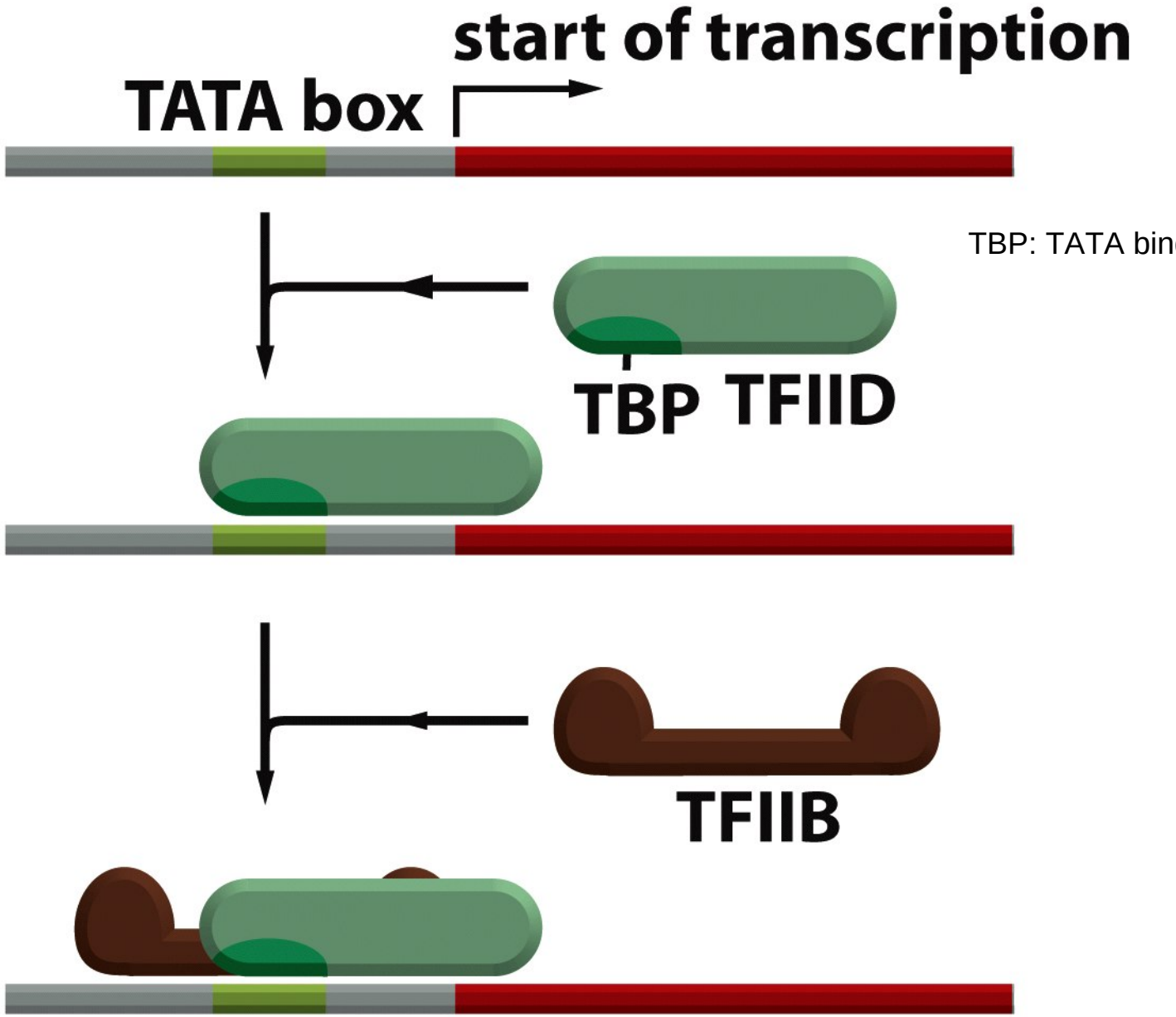


thymine

used in DNA

TRANSCRIPCIÓN EN EUCARIONTES

- Requiere la participación de 3 Ez.:
  - -RNA pol I: genes rRNA.
  - -RNA pol II: genes para todas las proteínas.
  - -RNA pol III: genes tRNA, genes rRNA, genes RNA pequeños.
- RNA pol II es similar a la RNA pol de procariontes, pero necesita de la participación de otras proteínas que en conjunto se denominan Factores Transcripcionales generales (TFII).



TBP: TATA binding protein

Figure 6-16 (part 1 of 3) Molecular Biology of the Cell (© Garland Science 2008)

CTD: dominio C-terminal

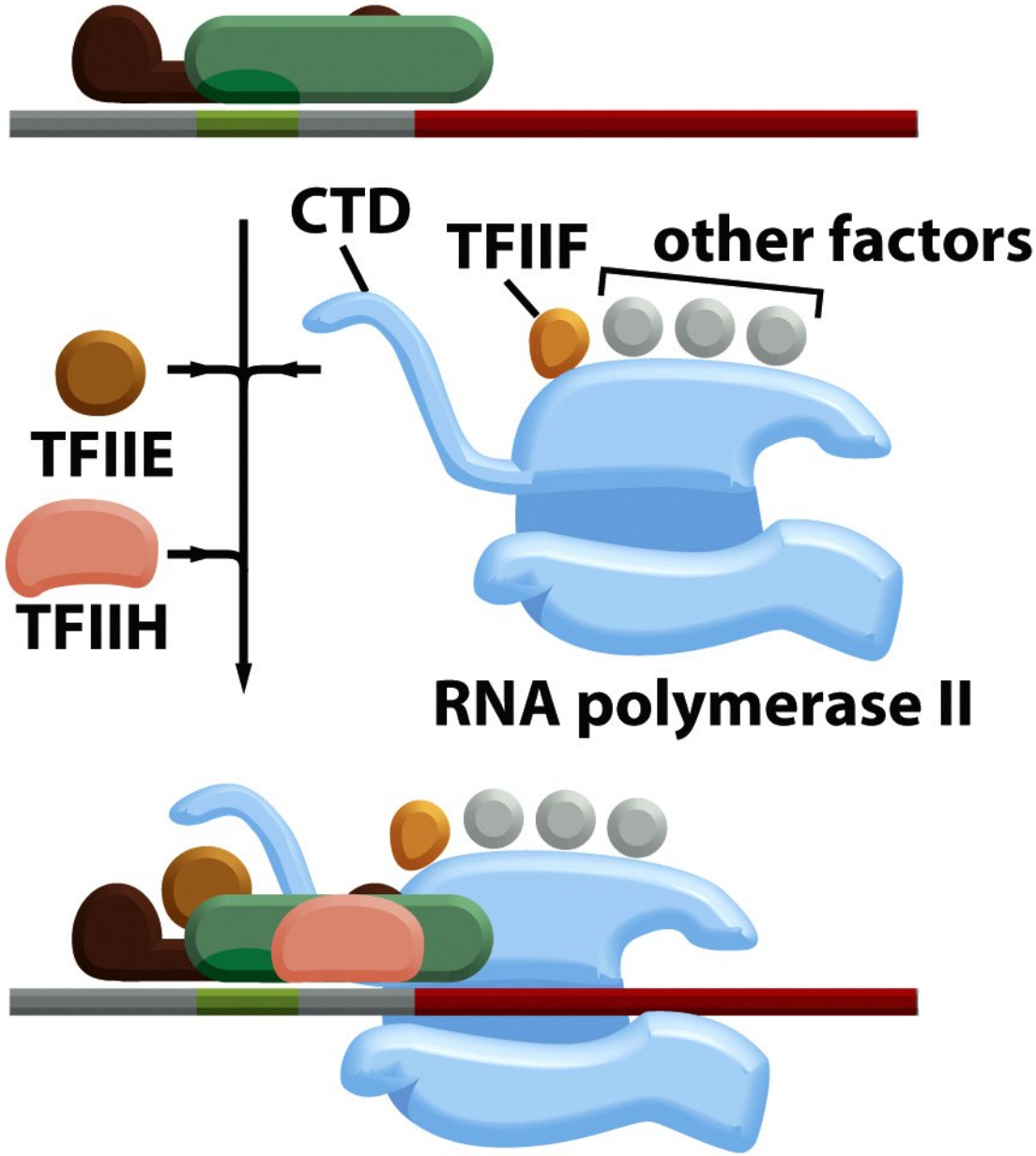


Figure 6-16 (part 2 of 3) Molecular Biology of the Cell (© Garland Science 2008)

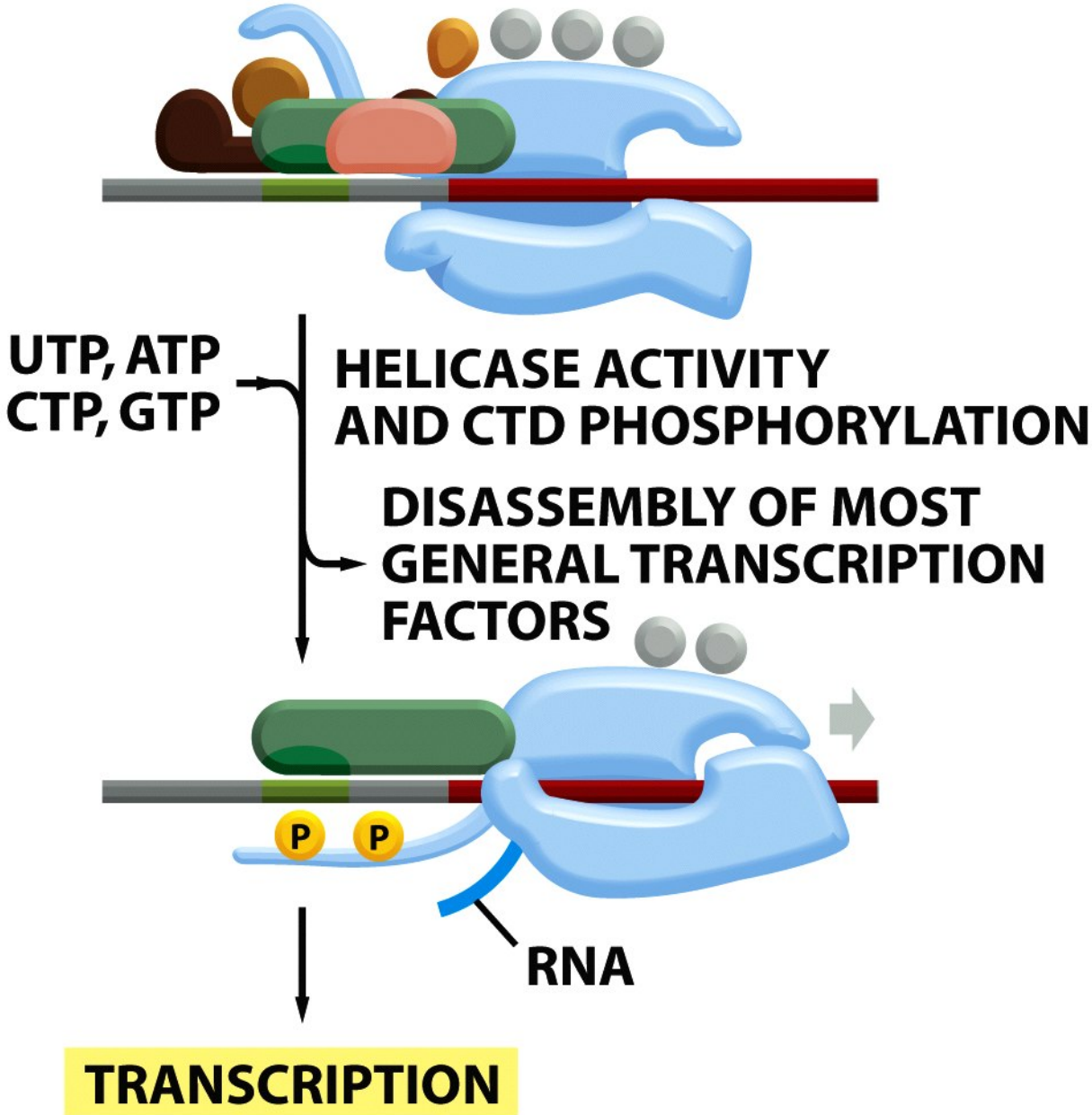


Figure 6-16 (part 3 of 3) Molecular Biology of the Cell (© Garland Science 2008)

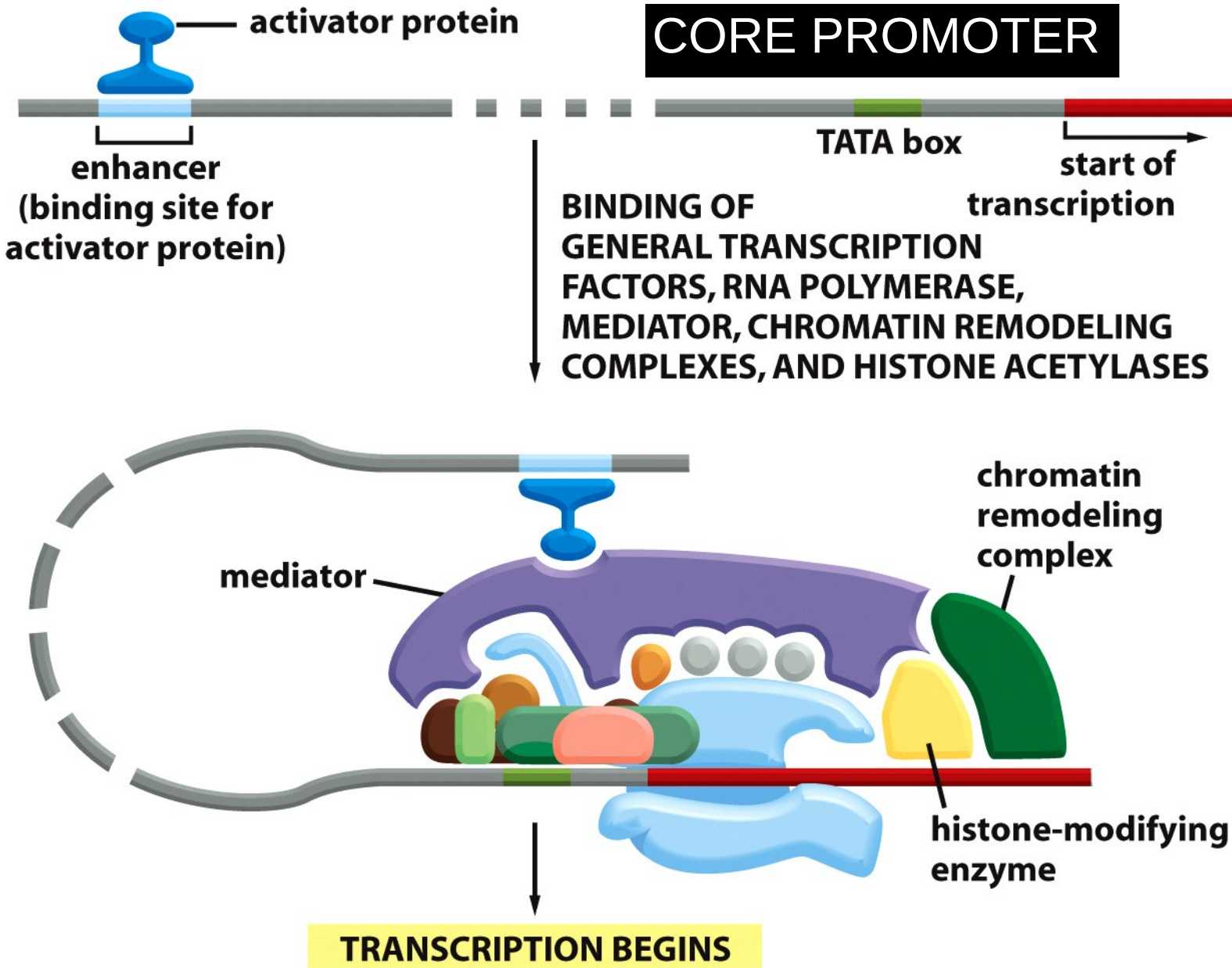


Figure 6-19 Molecular Biology of the Cell (© Garland Science 2008)

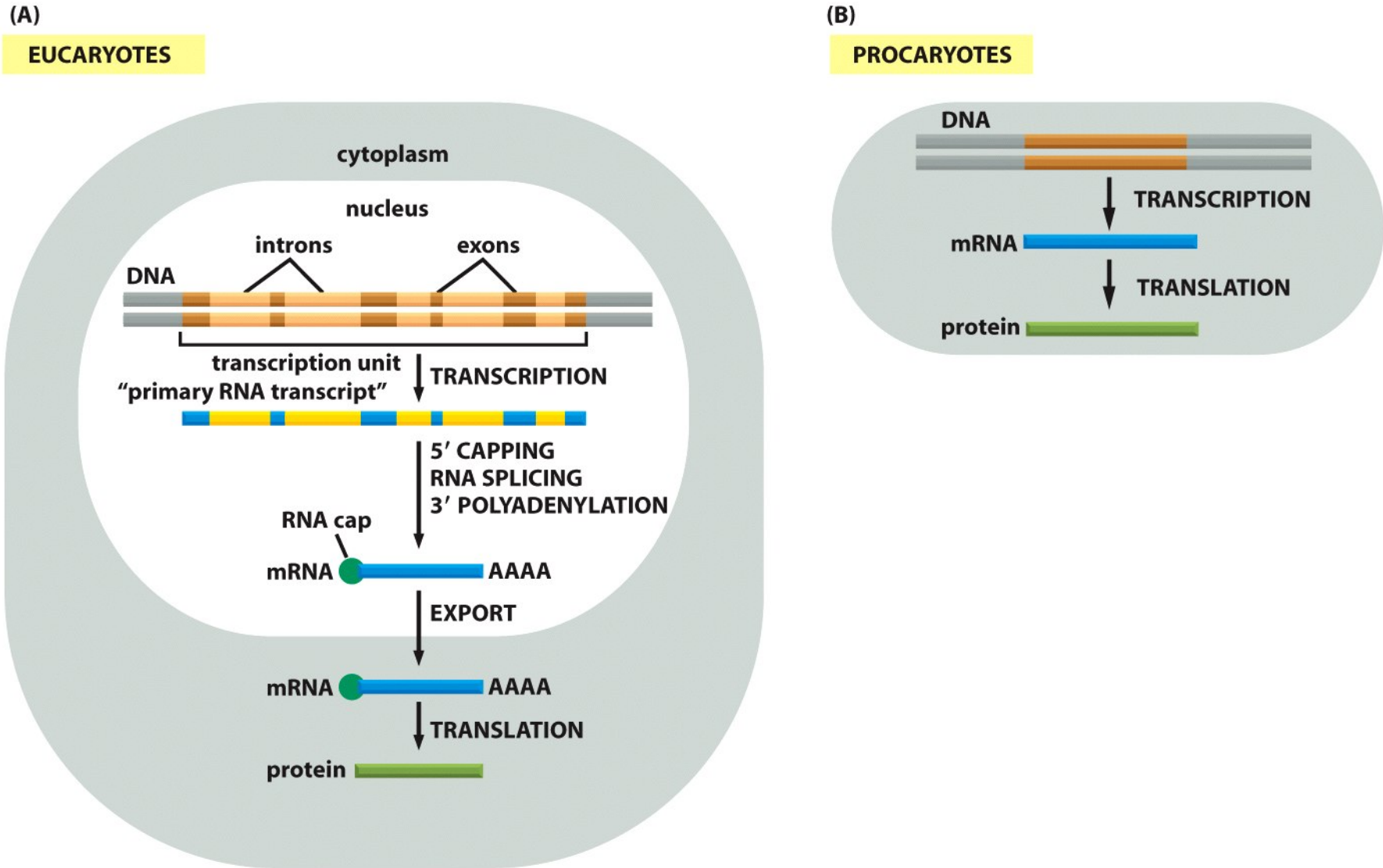


Figure 6-21 Molecular Biology of the Cell (© Garland Science 2008)

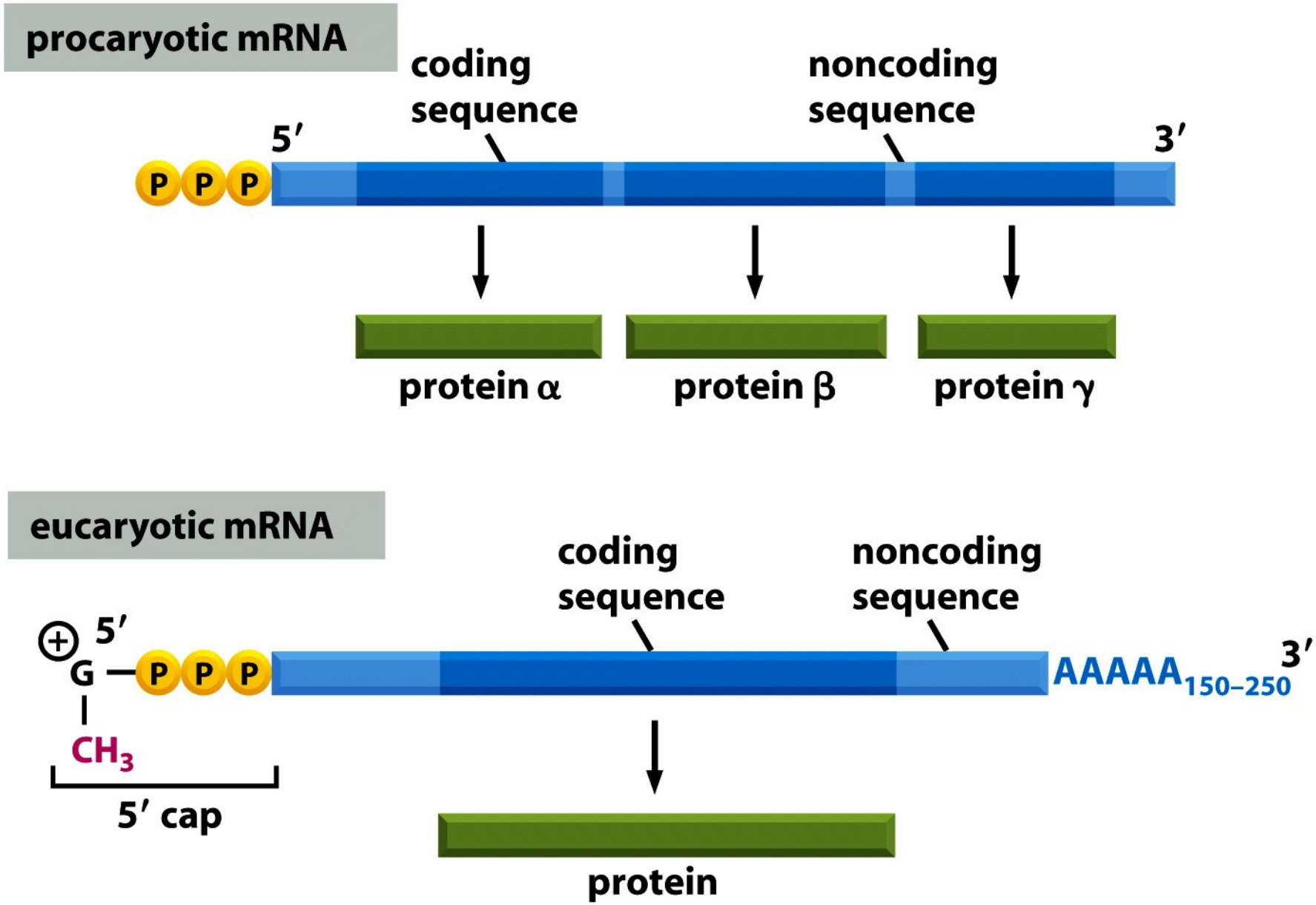


Figure 6-22a Molecular Biology of the Cell (© Garland Science 2008)

ALTERNATIVE SPLICING

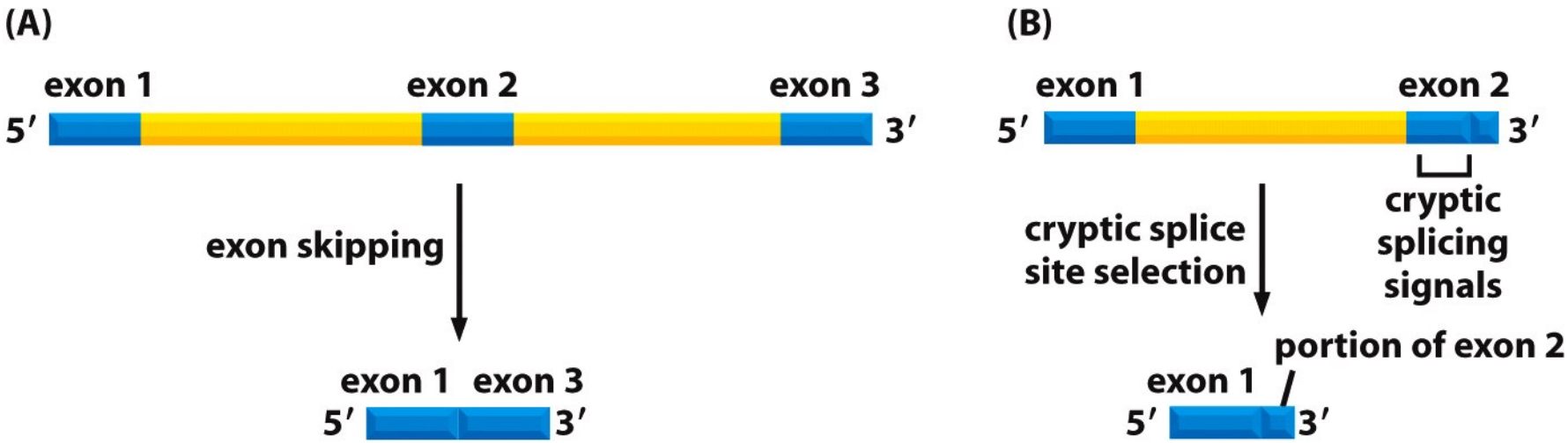


Figure 6-31 Molecular Biology of the Cell (© Garland Science 2008)

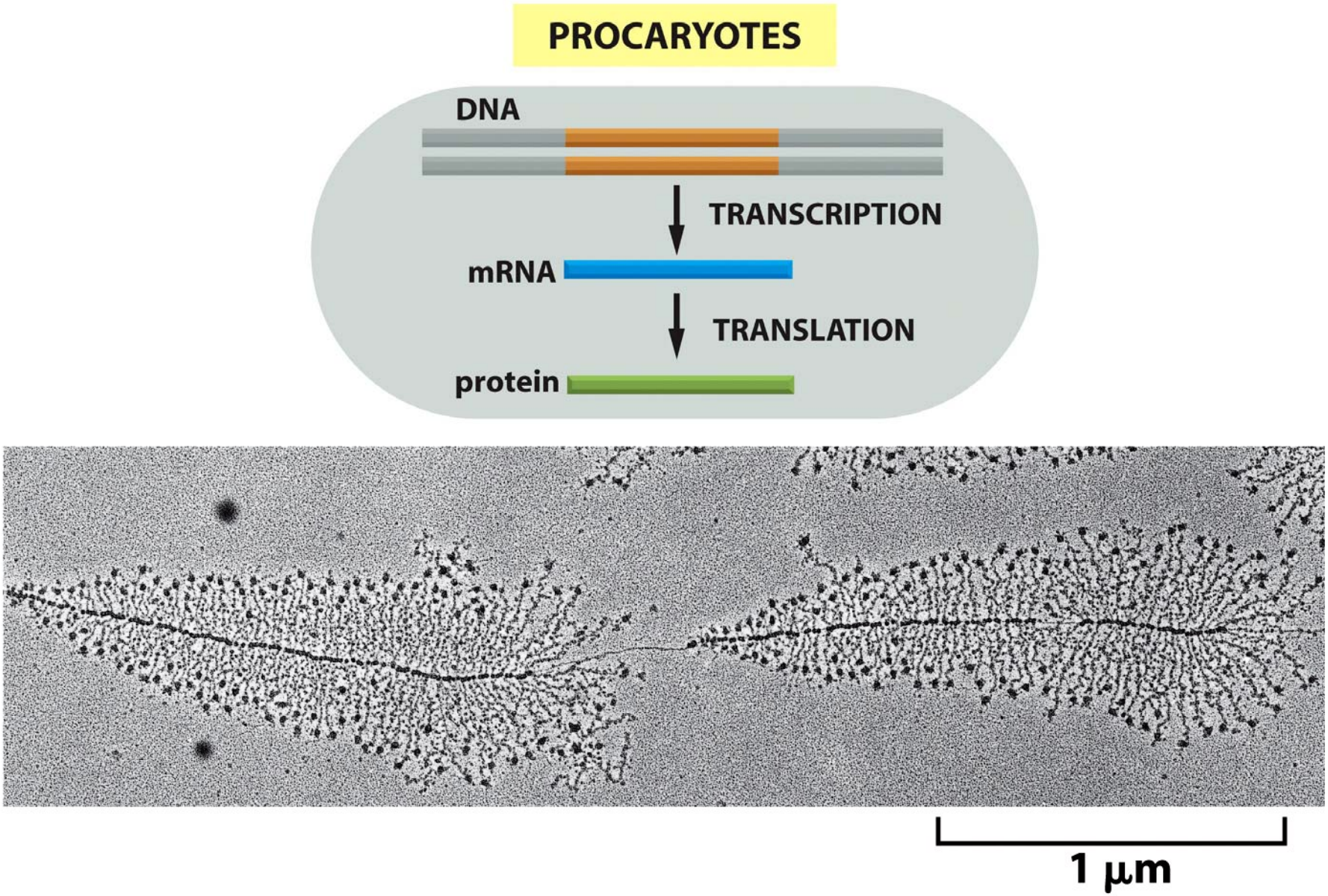
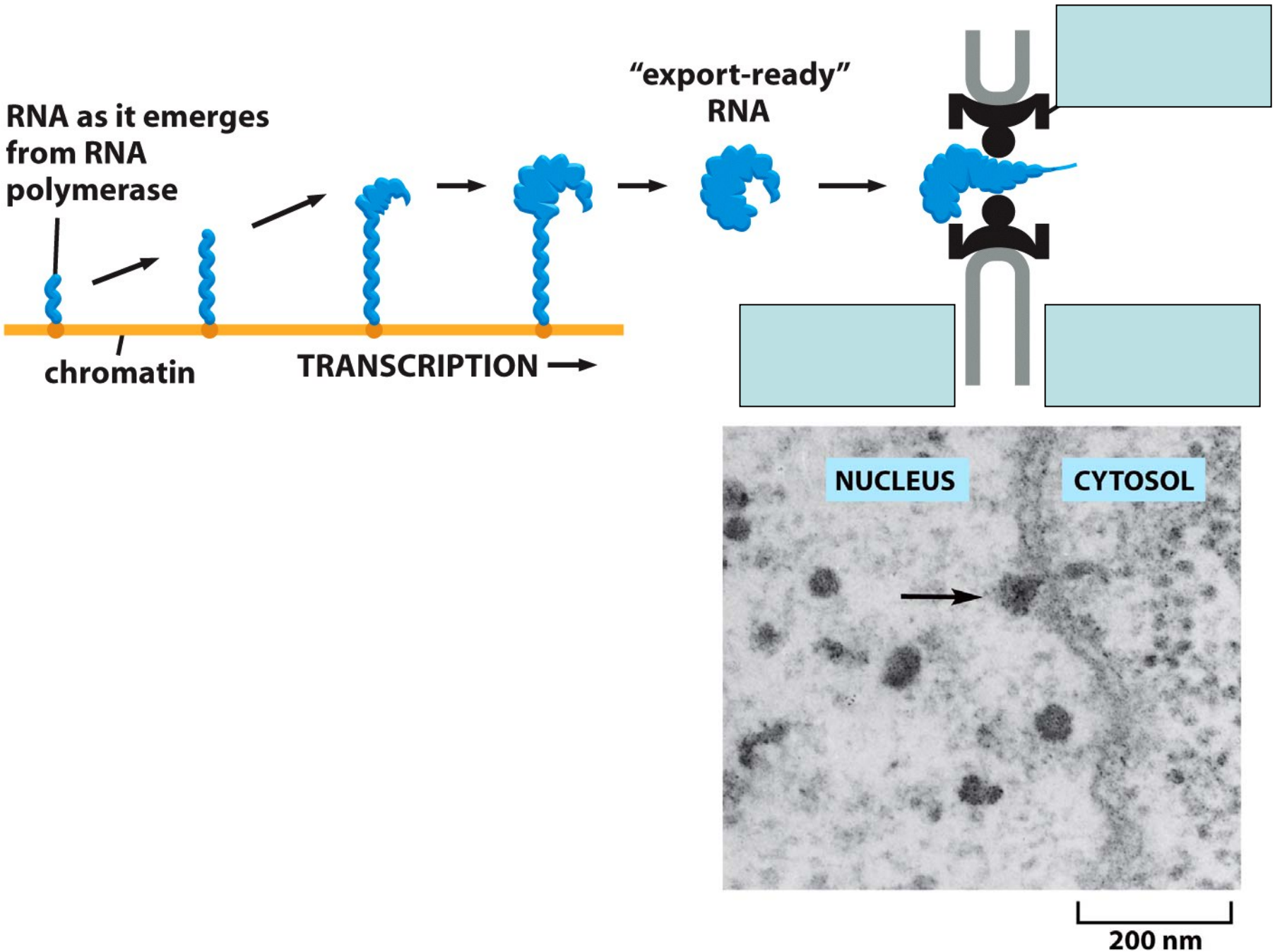


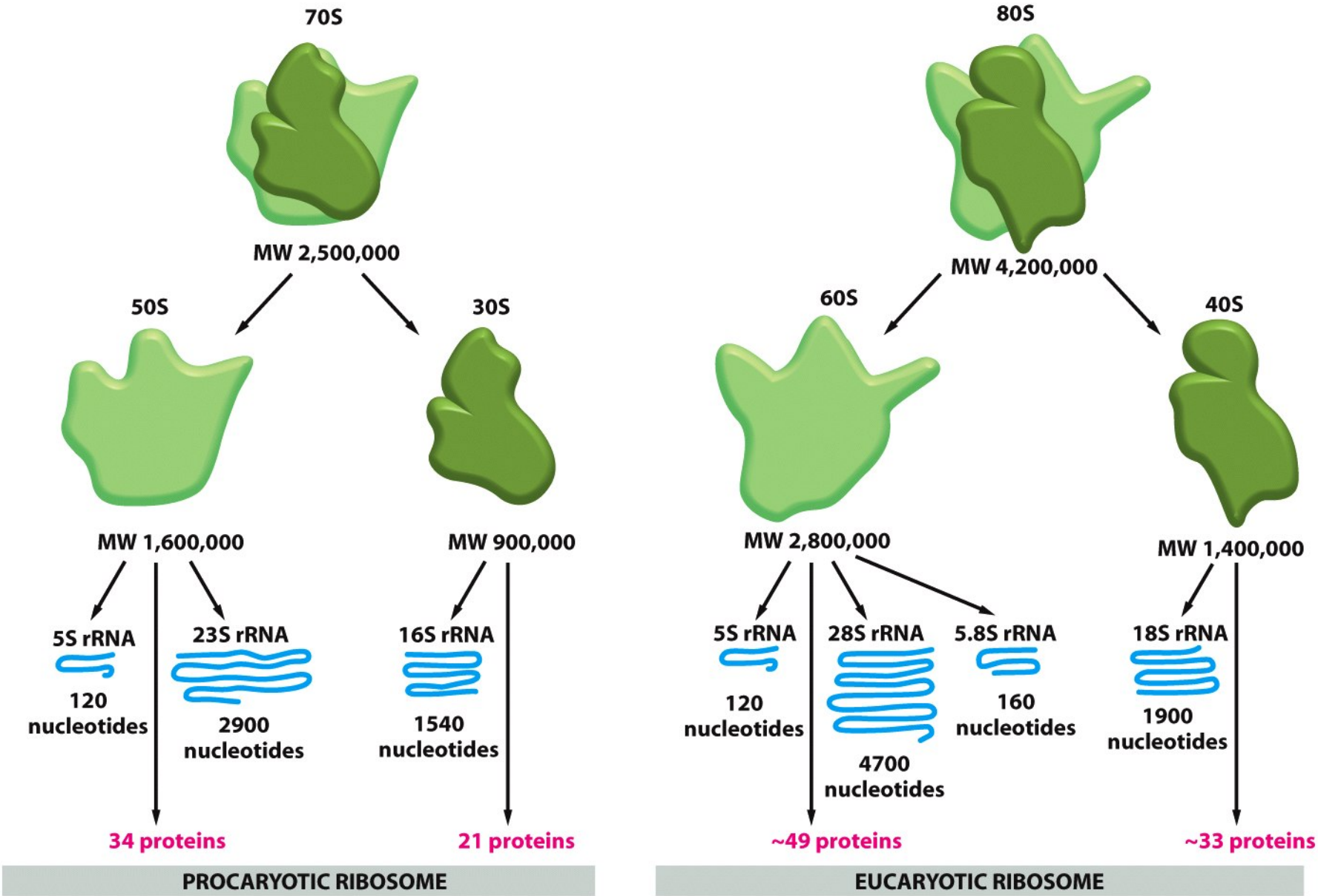
Figure 6-9 Molecular Biology of the Cell (© Garland Science 2008)

Table 6–2 The Three RNA Polymerases in Eucaryotic Cells

TYPE OF POLYMERASE	GENES TRANSCRIBED
RNA polymerase I	5.8S, 18S, and 28S rRNA genes
RNA polymerase II	all protein-coding genes, plus snoRNA genes, miRNA genes, siRNA genes, and most snRNA genes
RNA polymerase III	tRNA genes, 5S rRNA genes, some snRNA genes and genes for other small RNAs

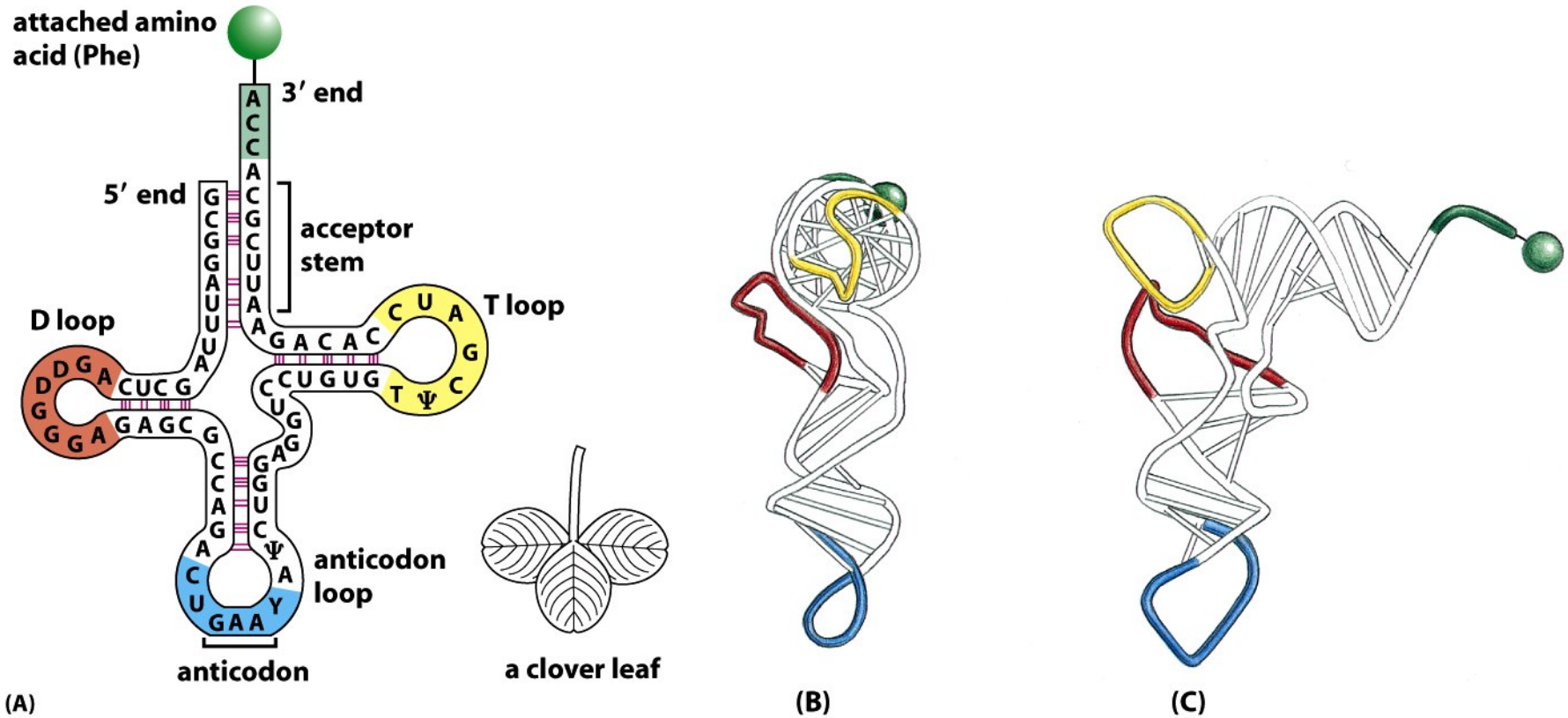
The rRNAs are named according to their "S" values, which refer to their rate of sedimentation in an ultracentrifuge. The larger the S value, the larger the rRNA.


RNA as it emerges from RNA polymerase
chromatin
TRANSCRIPTION
"export-ready" RNA
NUCLEUS
CYTOSOL
200 nm


70S
MW 2,500,000
50S
30S
MW 1,600,000
MW 900,000
5S rRNA
120 nucleotides
23S rRNA
2900 nucleotides
16S rRNA
1540 nucleotides
34 proteins
21 proteins
PROCARYOTIC RIBOSOME
80S
MW 4,200,000
60S
40S
MW 2,800,000
MW 1,400,000
5S rRNA
120 nucleotides
28S rRNA
4700 nucleotides
5.8S rRNA
160 nucleotides
18S rRNA
1900 nucleotides
~49 proteins
~33 proteins
EUCARYOTIC RIBOSOME

GCA GCC GCG GCU	AGA AGG CGA CGC CGG CGU	GAC GAU	AAC AAU	UGC UGU	GAA GAG	CAA CAG	GGA GGC GGG GGU	CAC CAU	AUA AUC AUU	UUA UUG CUA CUC CUG CUU	AAA AAG	AUG	UUC UUU	CCA CCC CCG CCU	AGC AGU UCA UCC UCG UCU	ACA ACC ACG ACU	UGG	UAC UAU	GUA GUC GUG GUU	UAA UAG UGA
Ala	Arg	Asp	Asn	Cys	Glu	Gln	Gly	His	Ile	Leu	Lys	Met	Phe	Pro	Ser	Thr	Trp	Tyr	Val	stop
A	R	D	N	C	E	Q	G	H	I	L	K	M	F	P	S	T	W	Y	V	

Molécula tRNA



5′ GCGGAUUUAGCUCAGDDGGGAGAGCGCCAGACUGAAYAΨCUGGAGGUCCUGUGTΨCGAUCCACAGAAUUCGCACCA 3′

(D)

anticodon

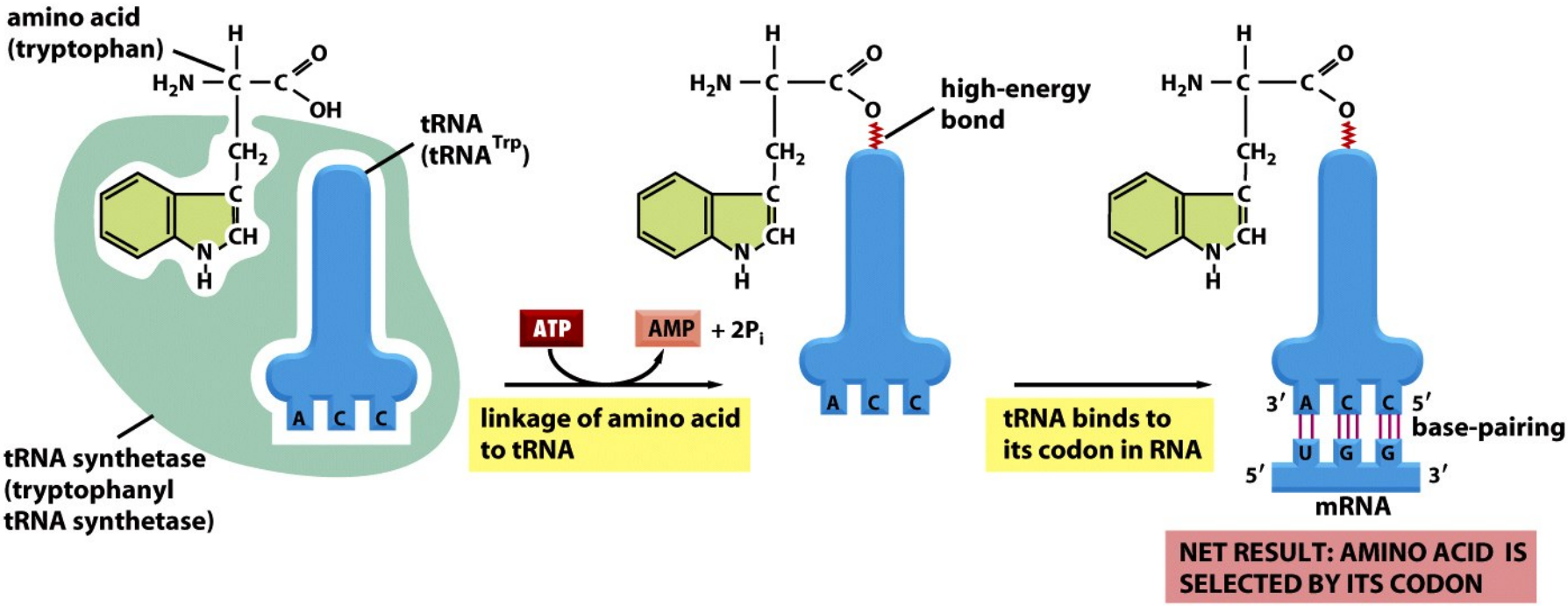
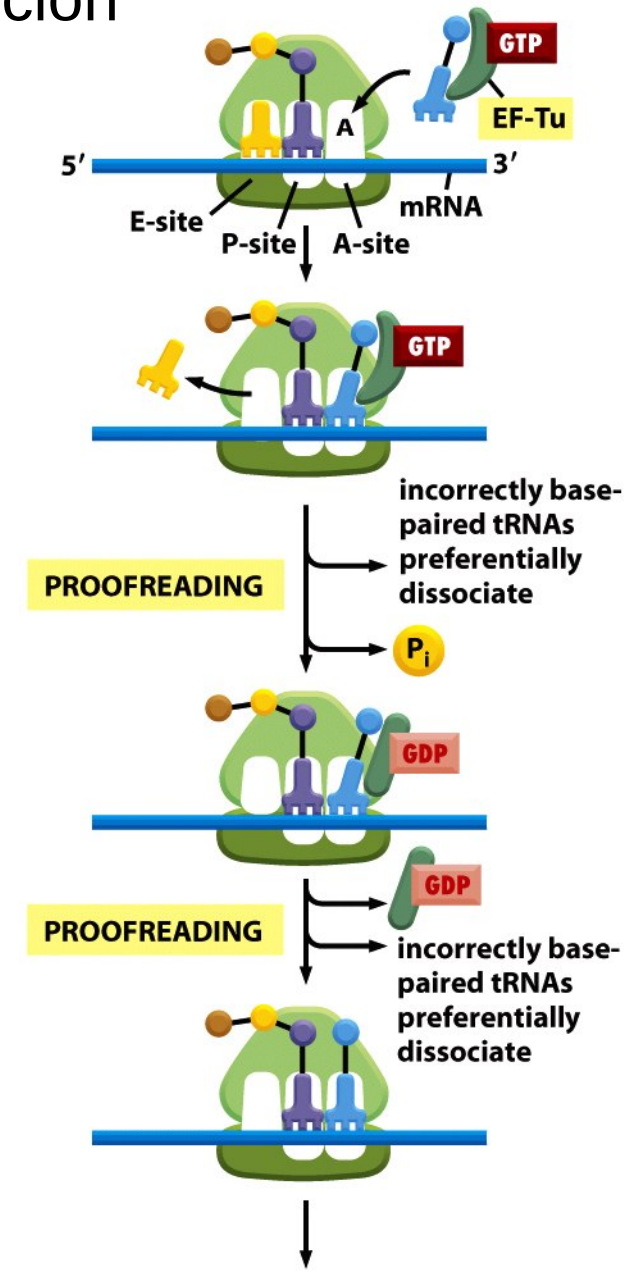
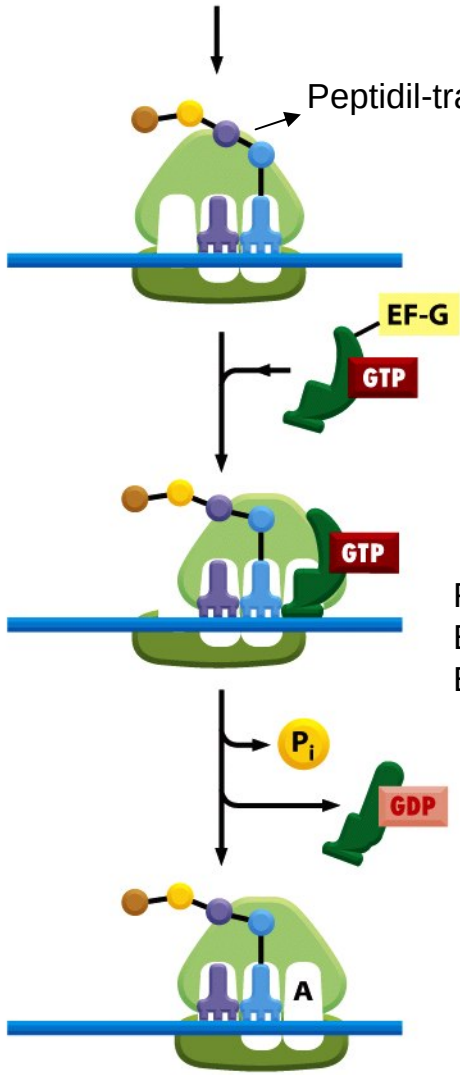


Figure 6-58 Molecular Biology of the Cell (© Garland Science 2008)

Traducción





Factores de elongación:
EF-Tu
EF-G

Figure 6-67 Molecular Biology of the Cell (© Garland Science 2008)

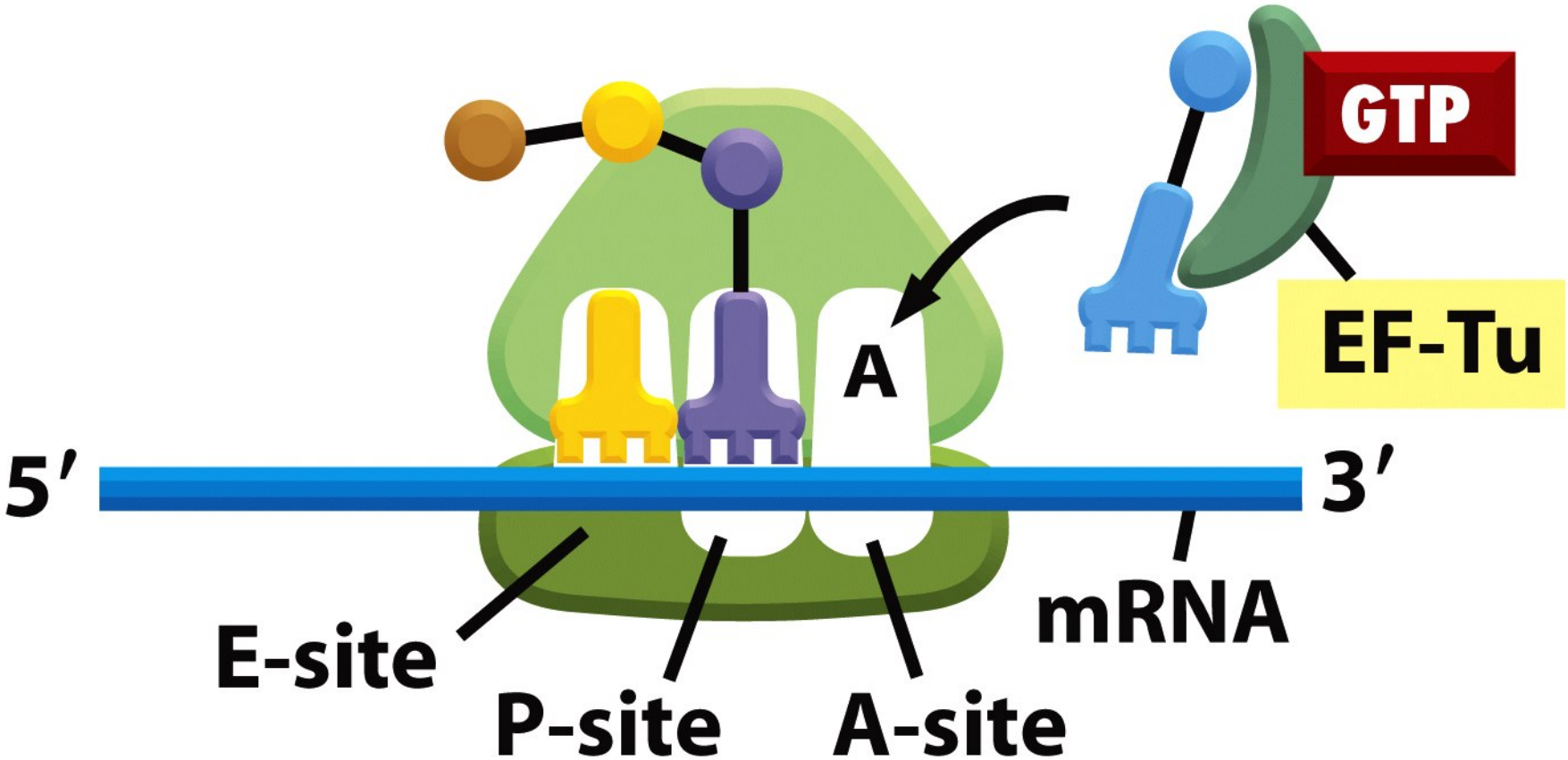


Figure 6-67 (part 1 of 7) Molecular Biology of the Cell (© Garland Science 2008)

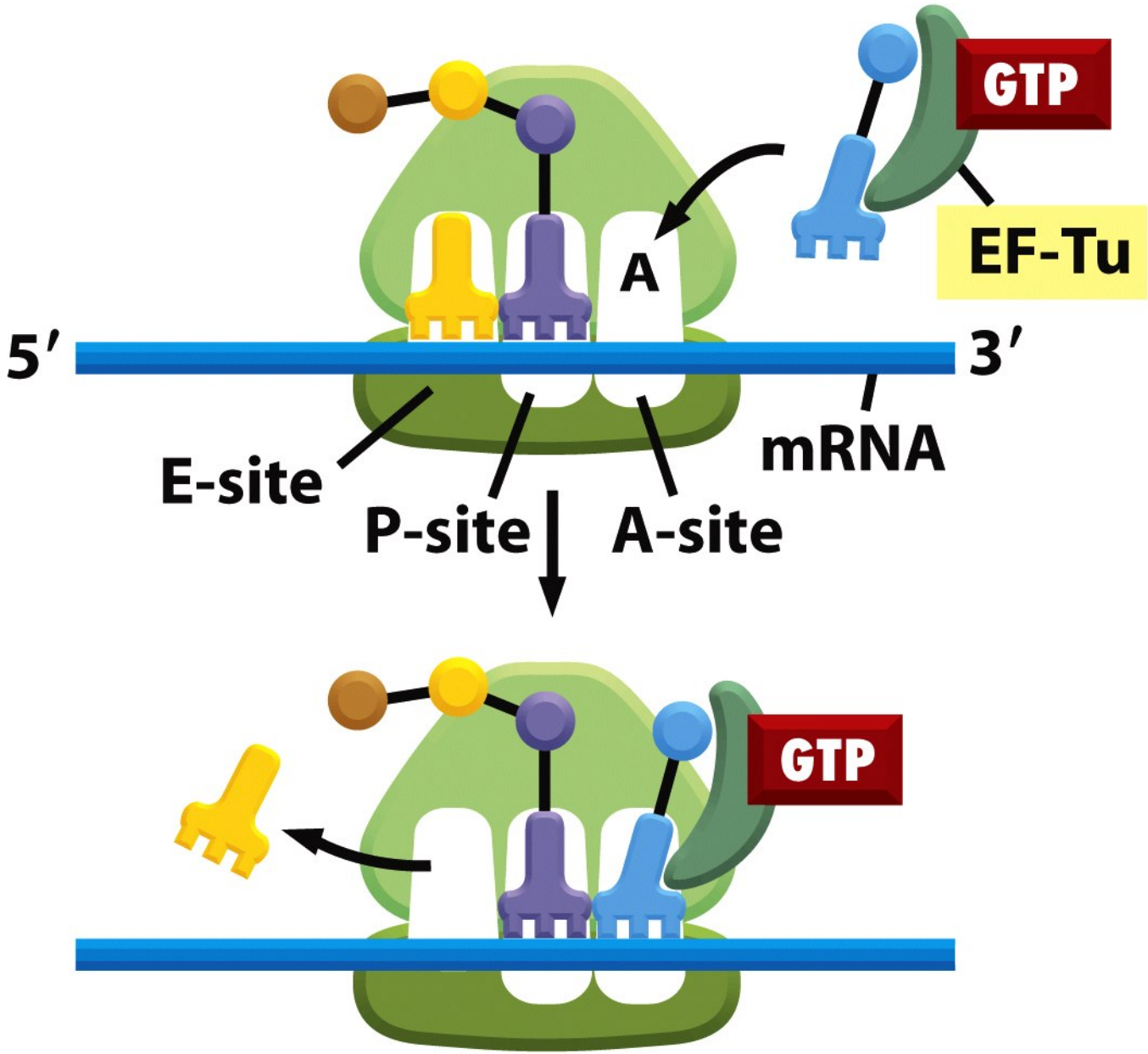


Figure 6-67 (part 2 of 7) Molecular Biology of the Cell (© Garland Science 2008)

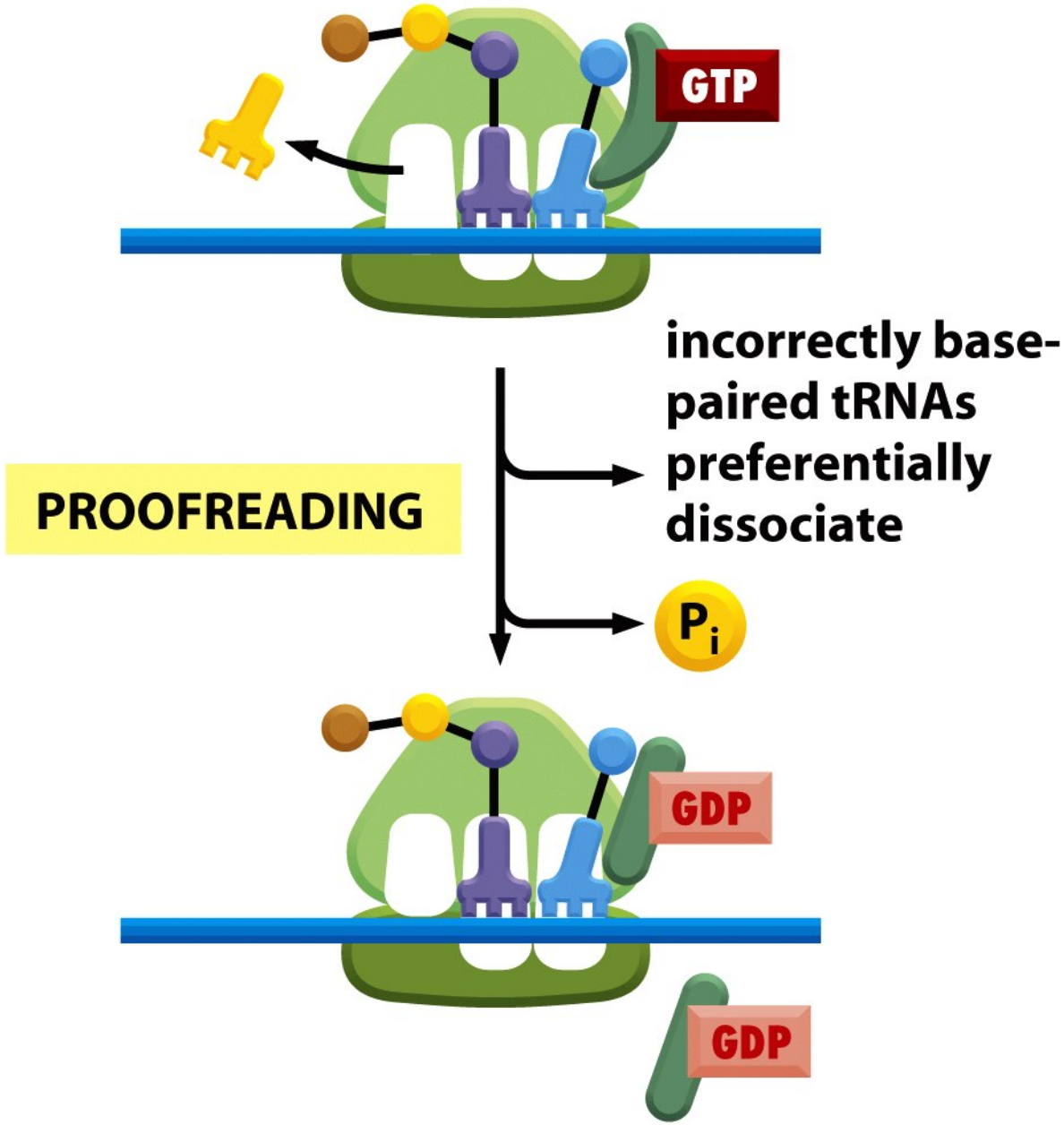


Figure 6-67 (part 3 of 7) Molecular Biology of the Cell (© Garland Science 2008)

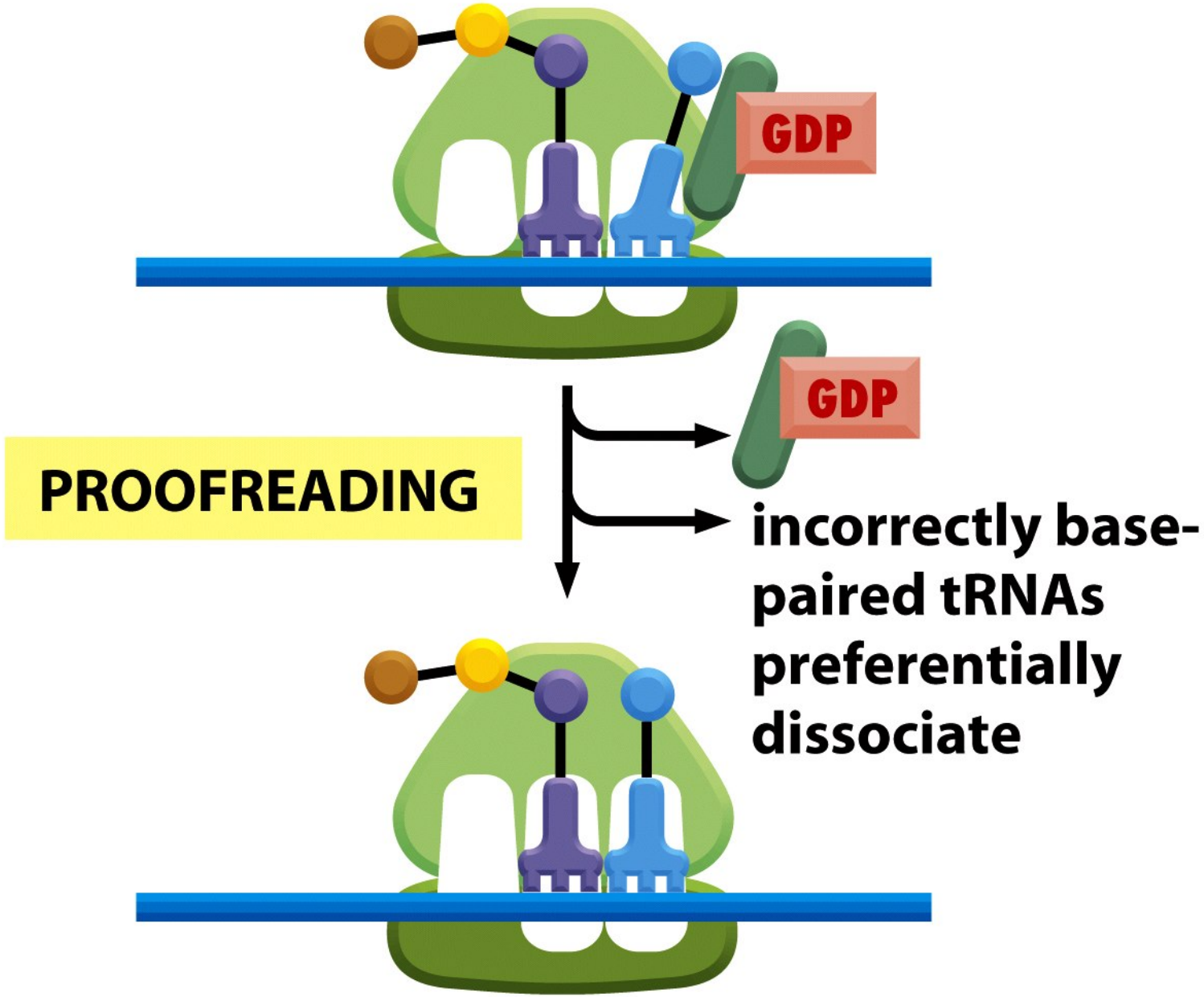


Figure 6-67 (part 4 of 7) Molecular Biology of the Cell (© Garland Science 2008)

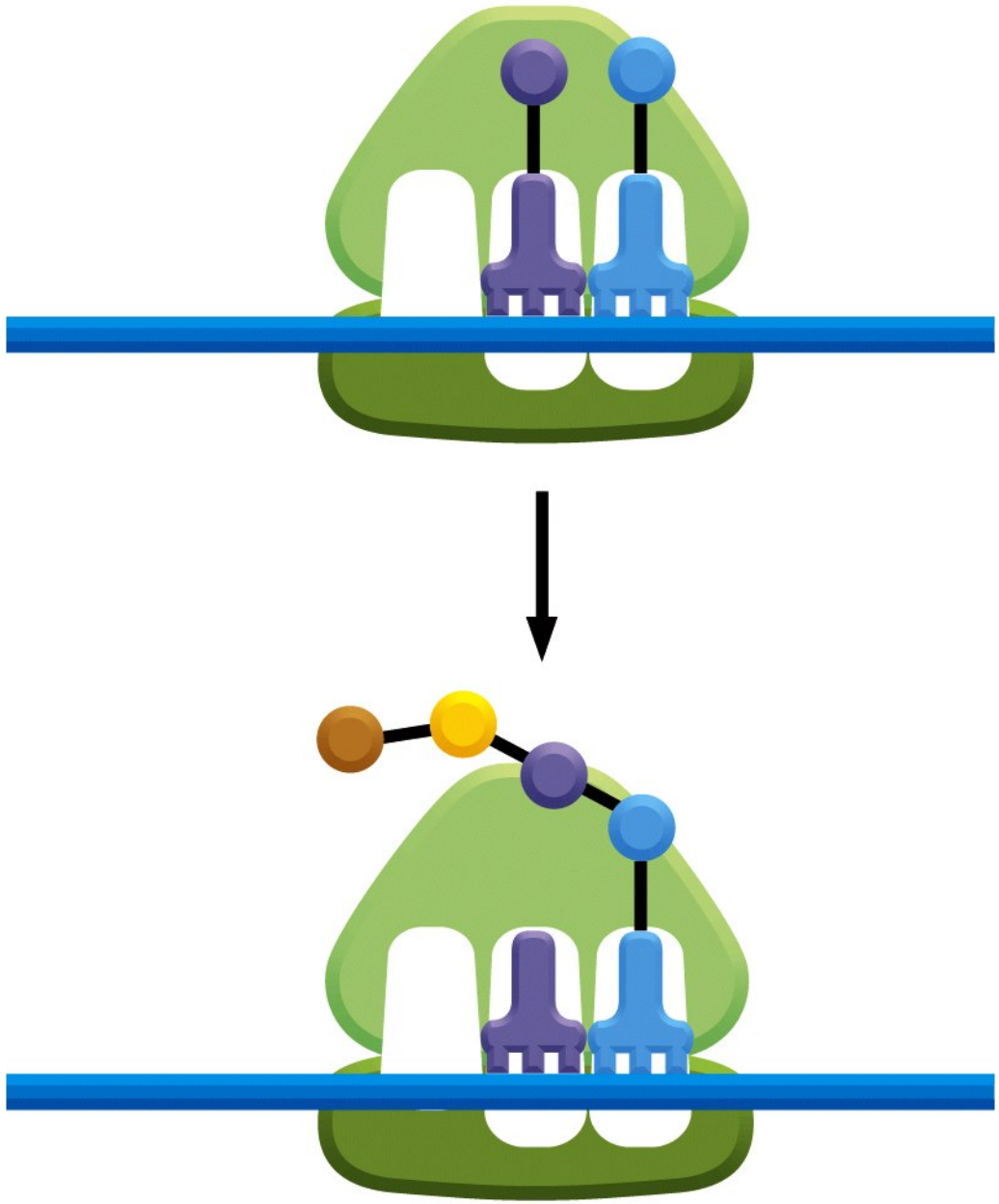


Figure 6-67 (part 5 of 7) Molecular Biology of the Cell (© Garland Science 2008)

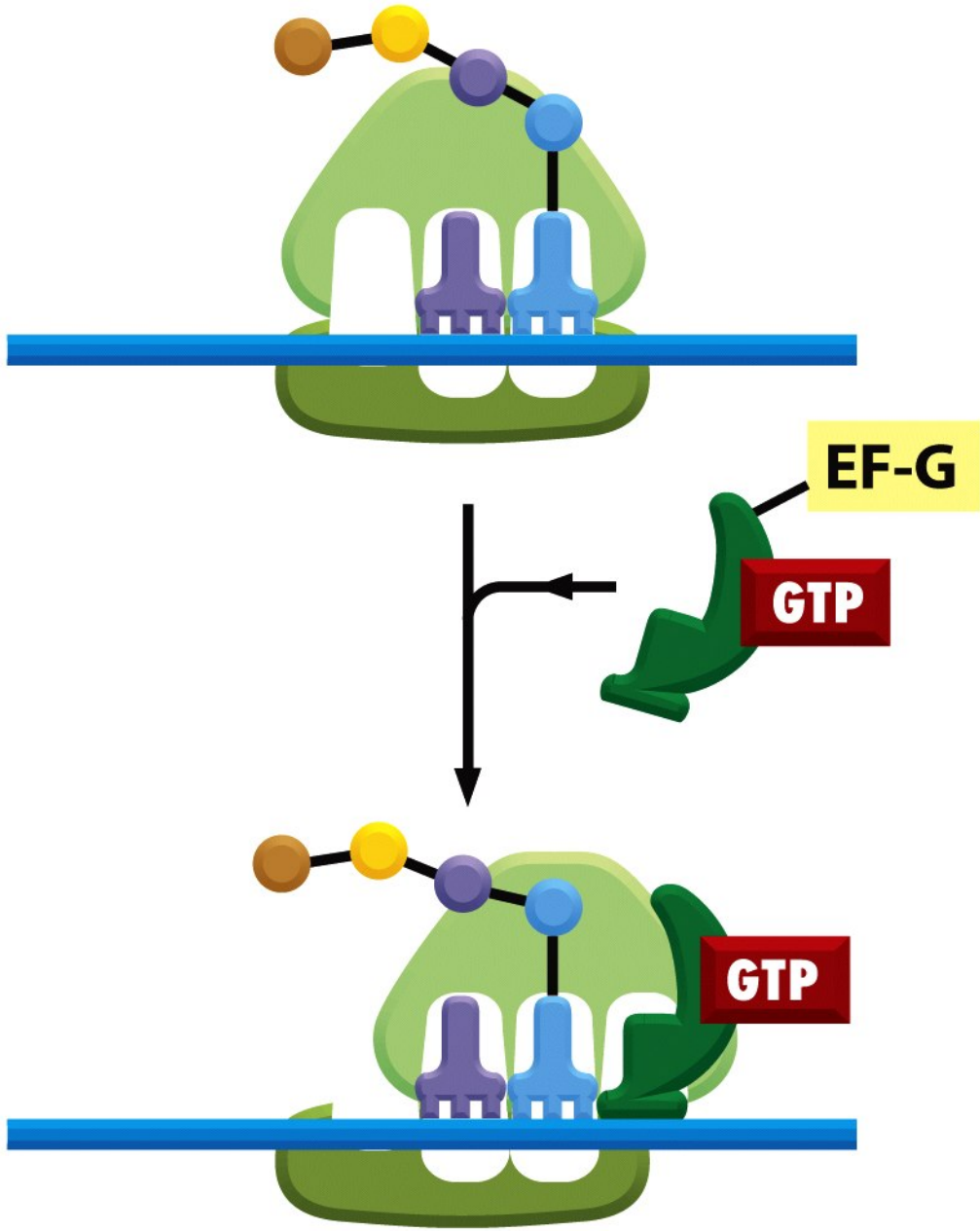


Figure 6-67 (part 6 of 7) Molecular Biology of the Cell (© Garland Science 2008)

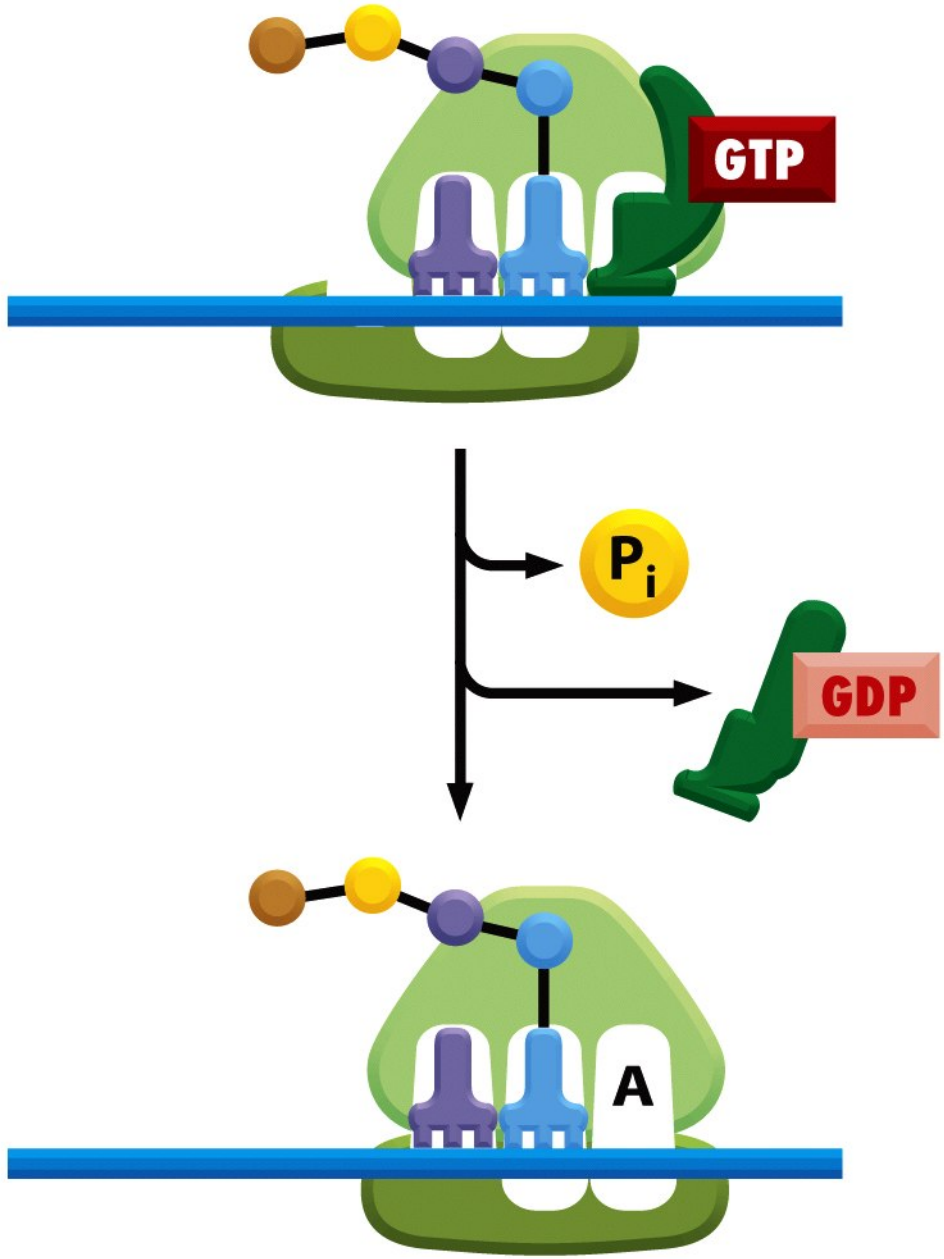
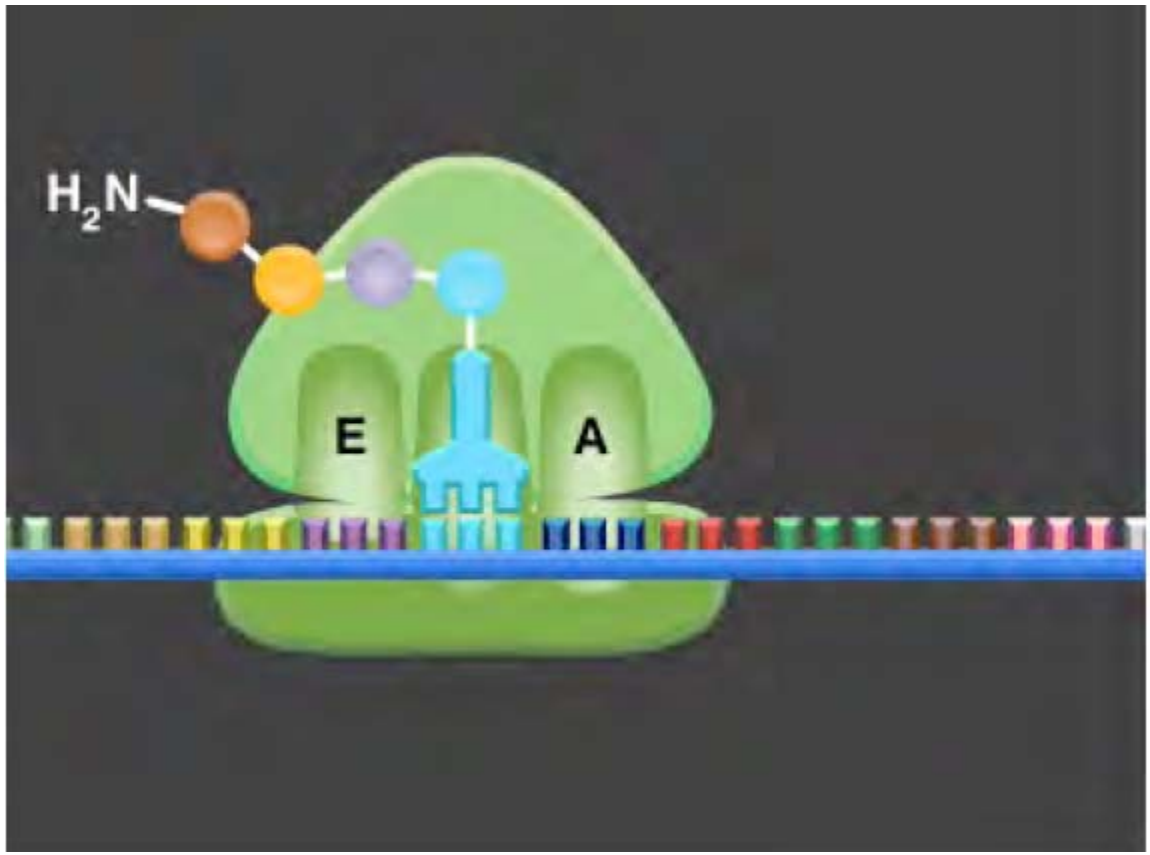


Figure 6-67 (part 7 of 7) Molecular Biology of the Cell (© Garland Science 2008)

Video 4



Reconocimiento Inicial

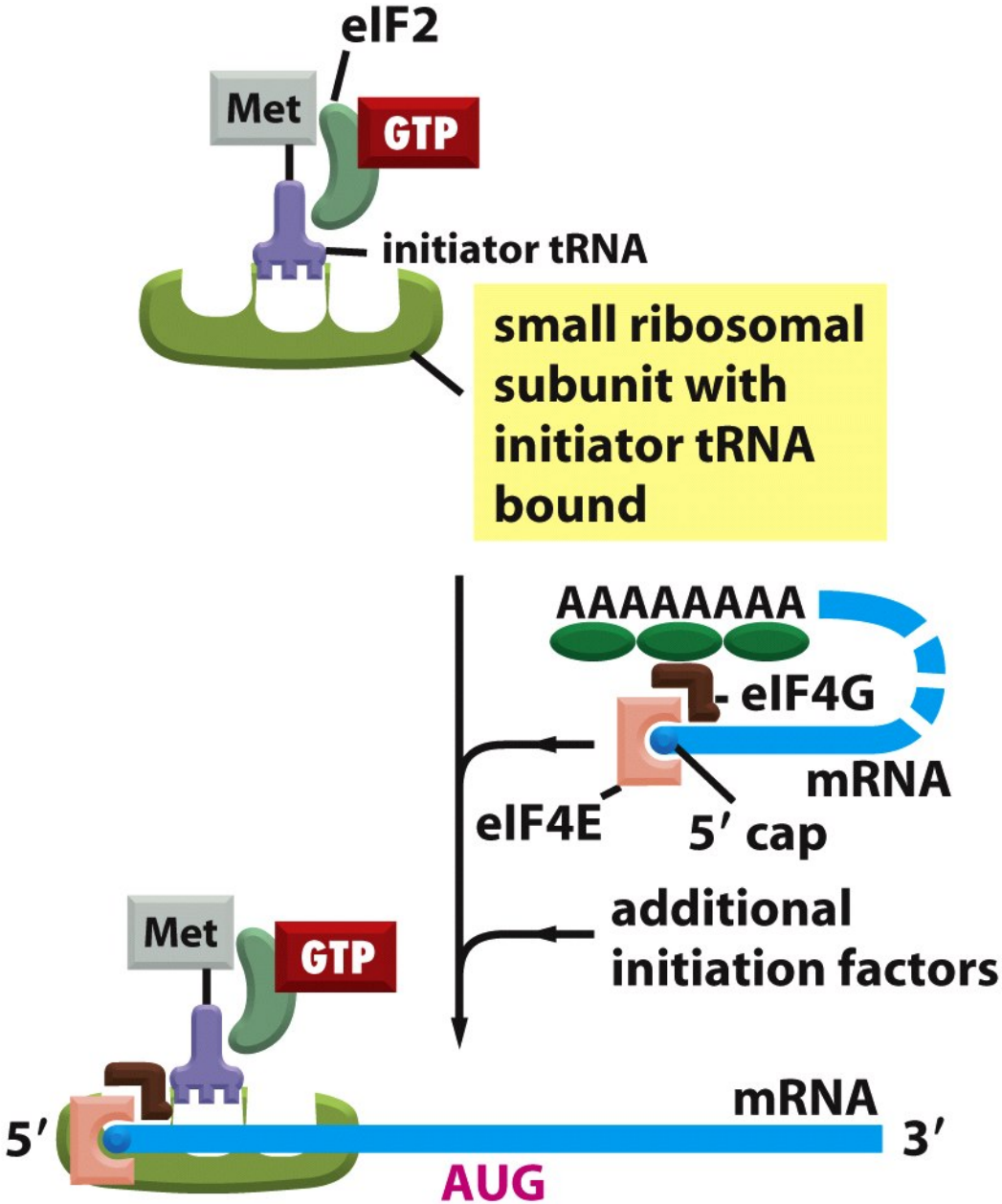


Figure 6-72 (part 1 of 5) Molecular Biology of the Cell (© Garland Science 2008)

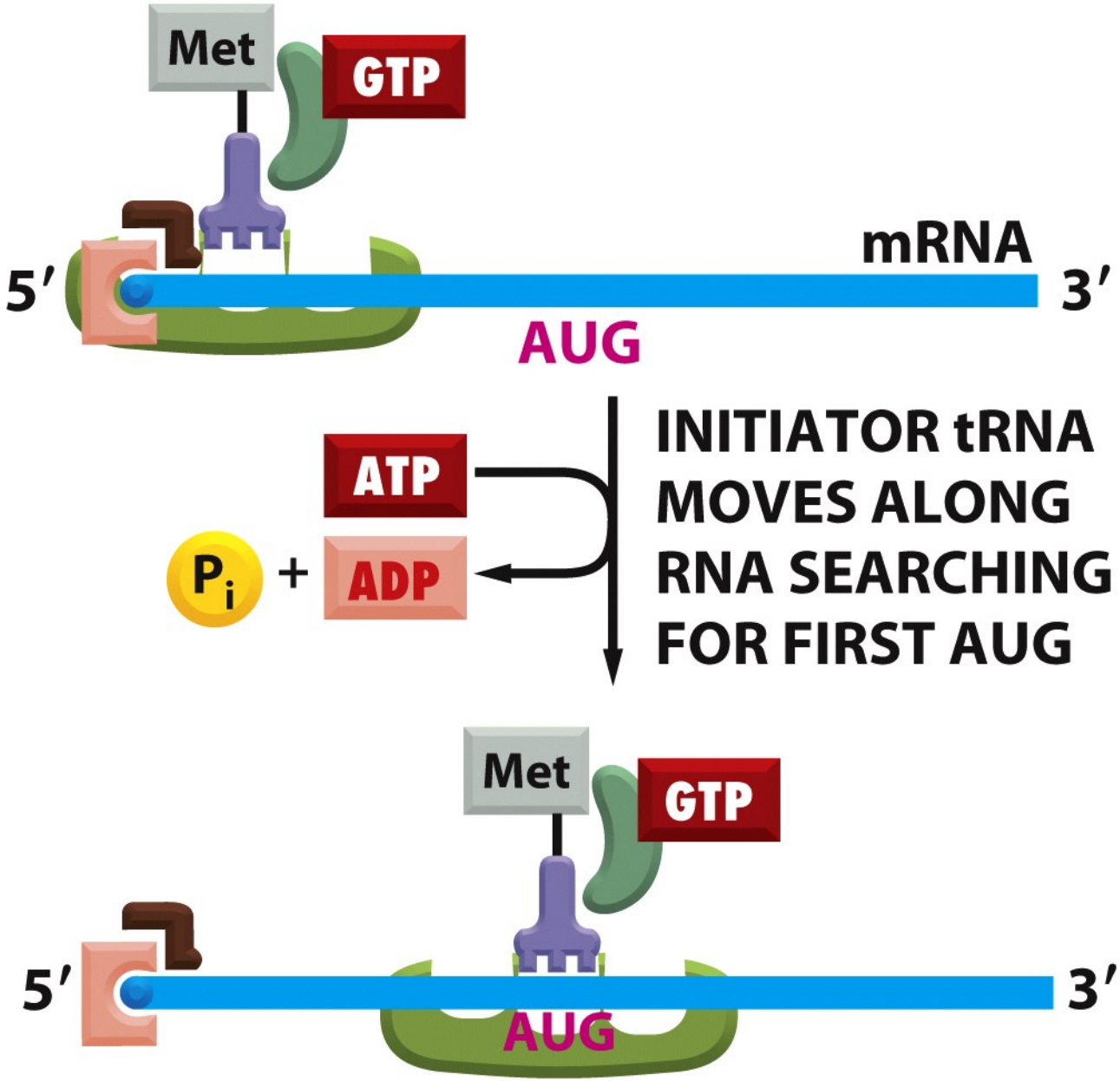


Figure 6-72 (part 2 of 5) Molecular Biology of the Cell (© Garland Science 2008)

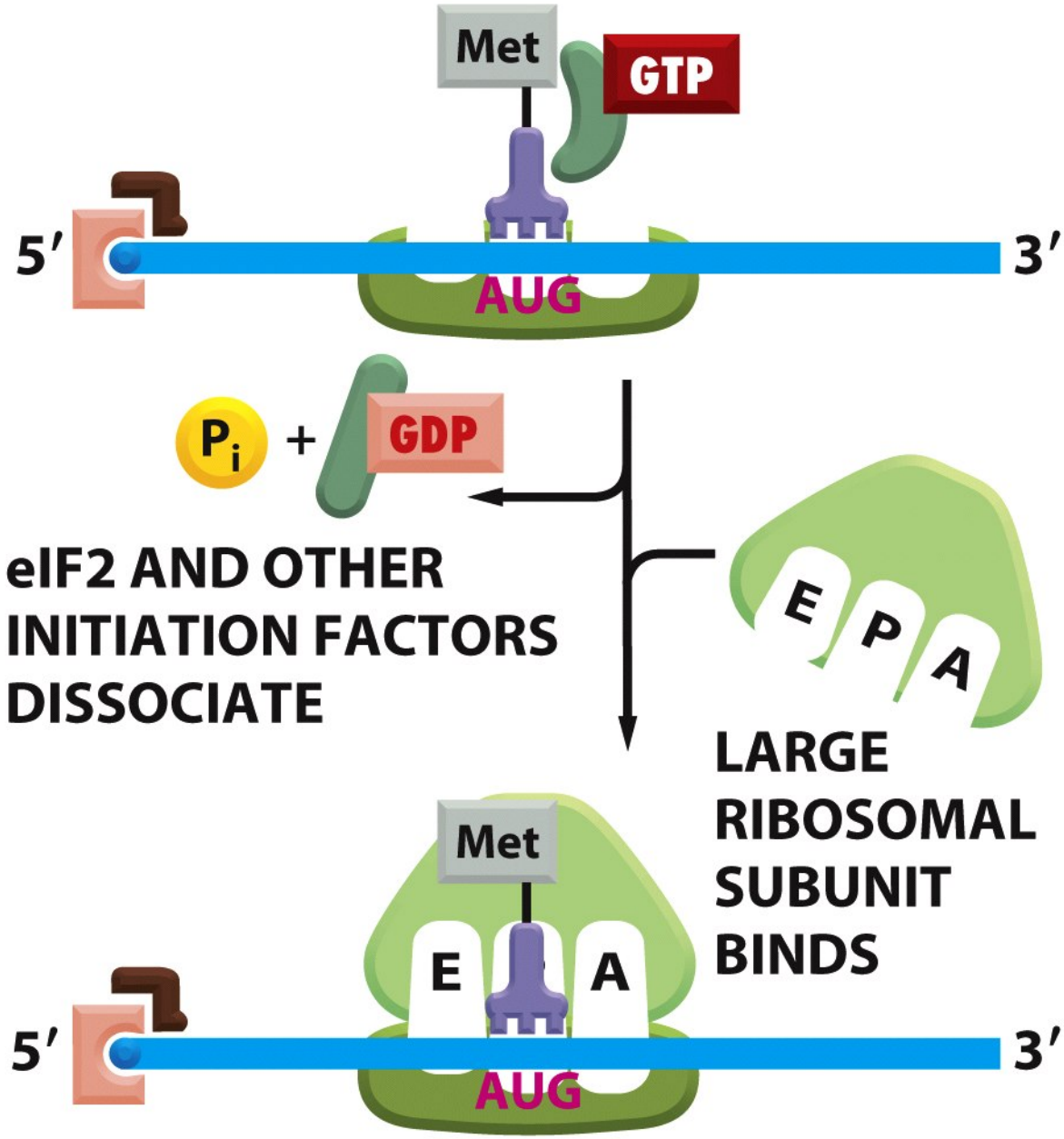


Figure 6-72 (part 3 of 5) Molecular Biology of the Cell (© Garland Science 2008)

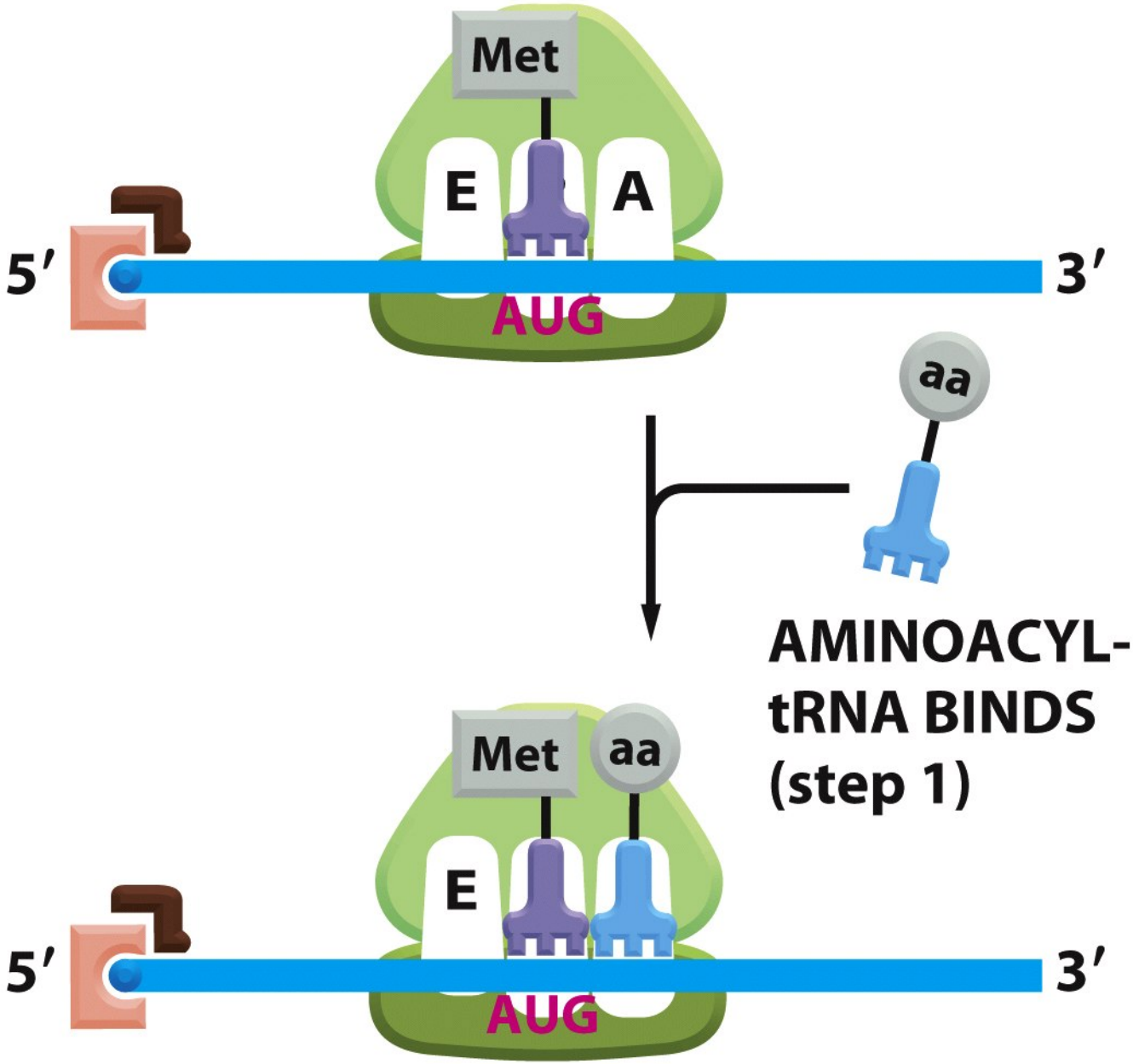


Figure 6-72 (part 4 of 5) Molecular Biology of the Cell (© Garland Science 2008)

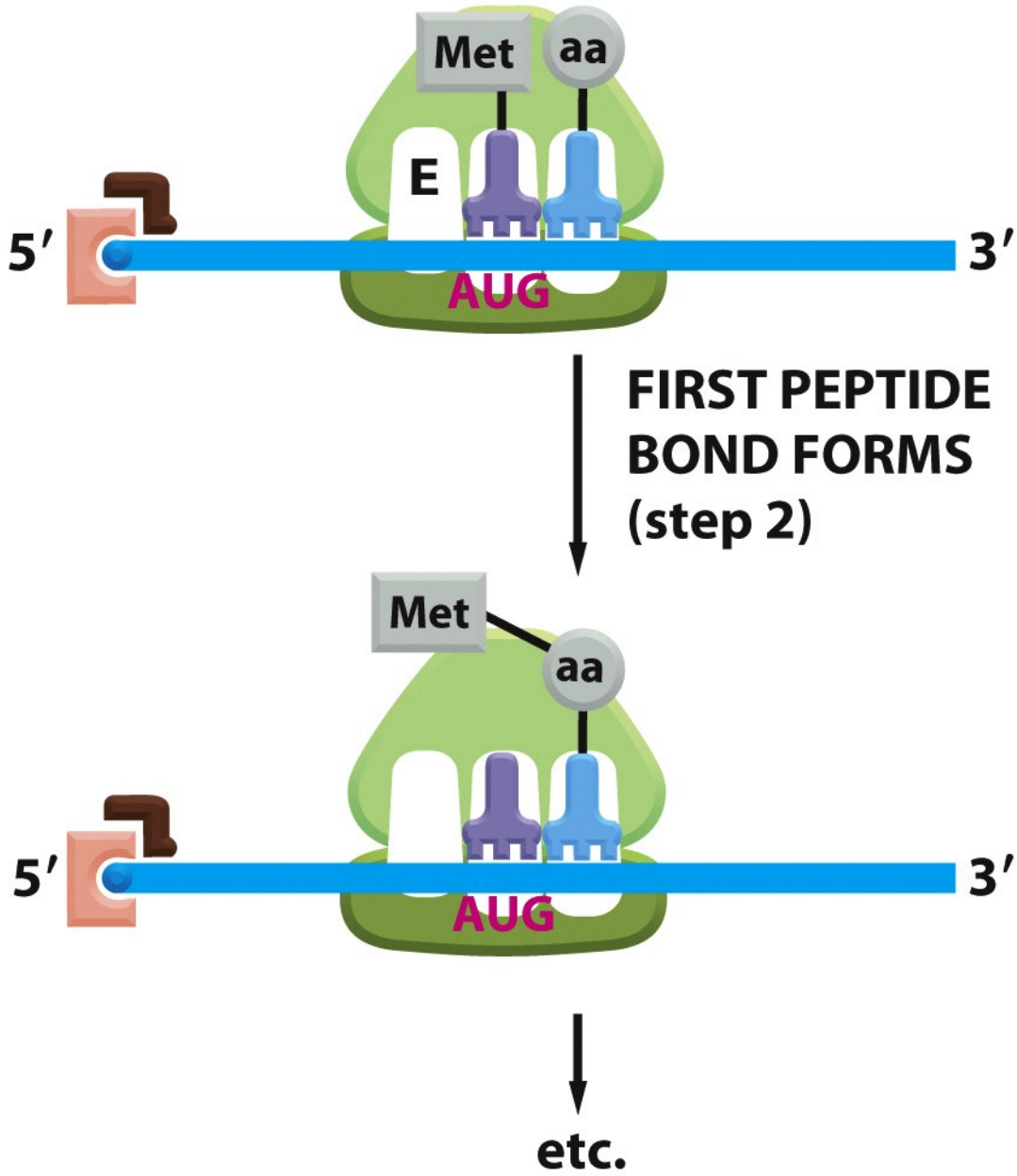
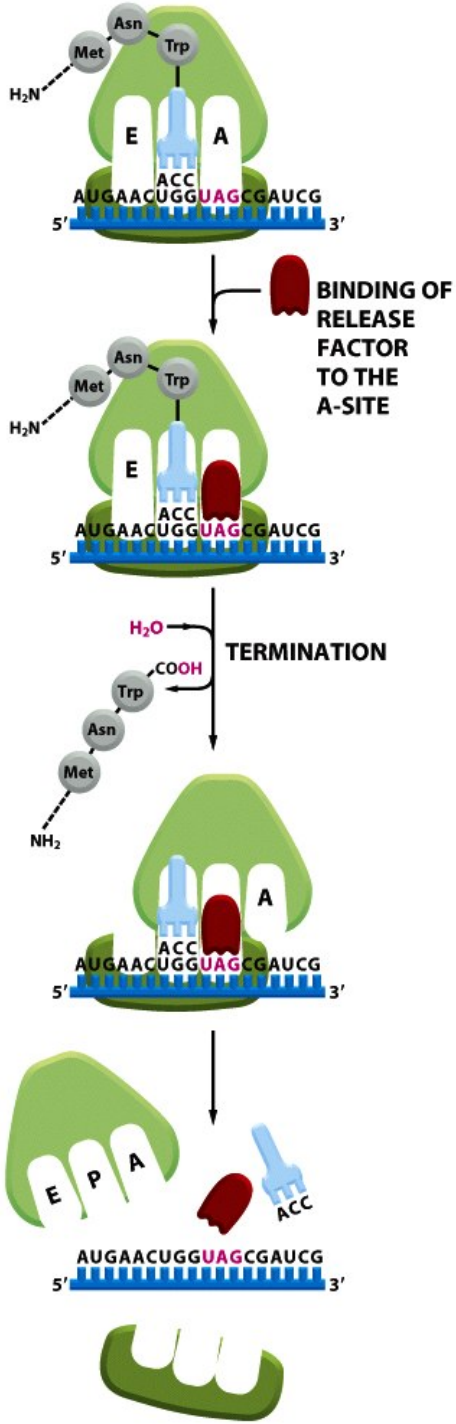


Figure 6-72 (part 5 of 5) Molecular Biology of the Cell (© Garland Science 2008)

Terminación



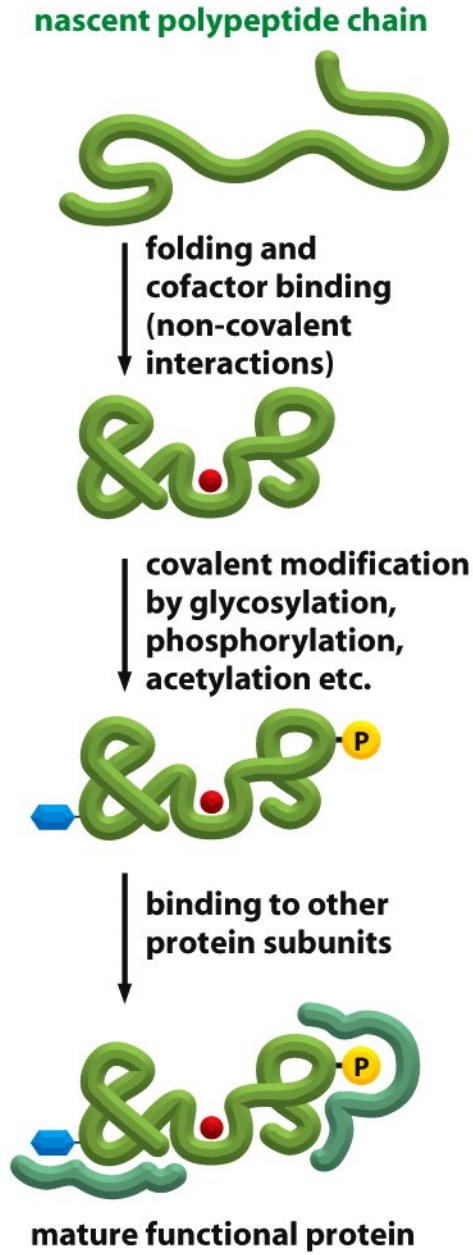


Figure 6-82 Molecular Biology of the Cell (© Garland Science 2008)

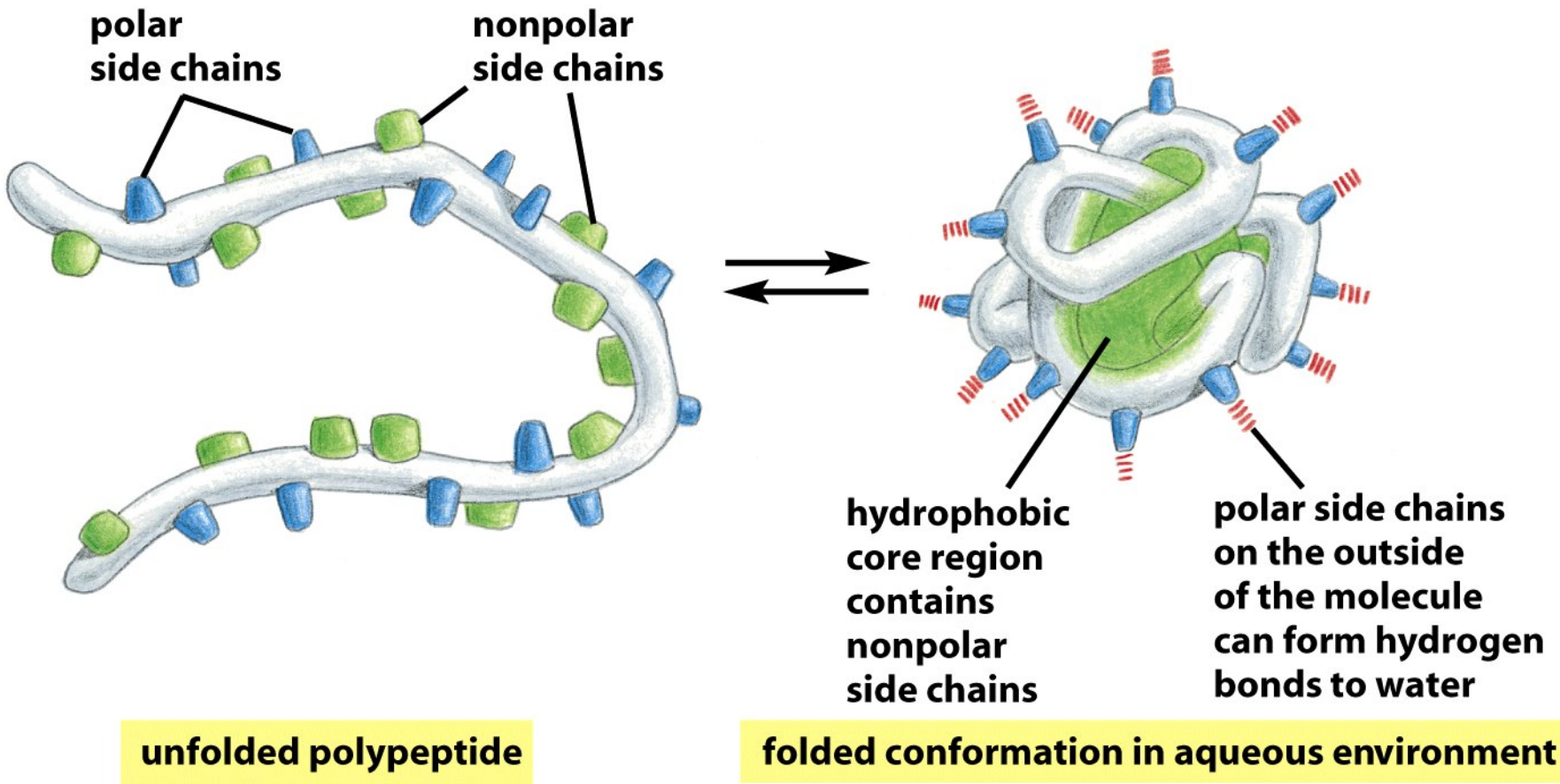


Figure 3-5 Molecular Biology of the Cell 5/e (© Garland Science 2008)