

A DAY MAY COME, WHEN WE FAIL AN EXAM



BUT IT IS NOT THIS DAY!

quickmeme.com

GENETICS: EXAM II REVIEW

Exam Details



Monday, April 27th
between 2:50-3:10pm



50 minutes to complete

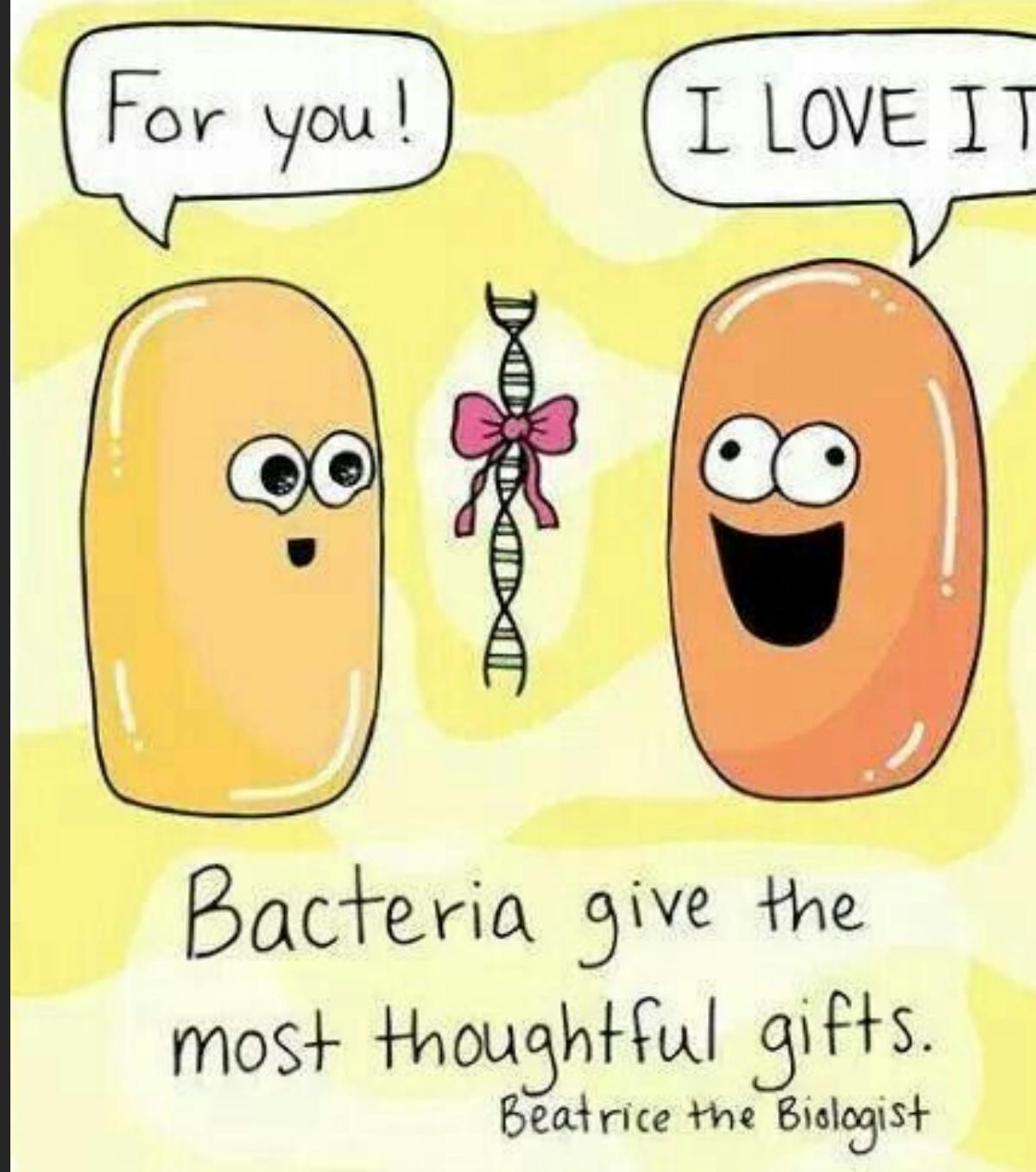


40 multiple-choice
questions (all displayed)



Open book

Chapter 5: Bacterial Genetics



Bacteria exchange DNA by several processes

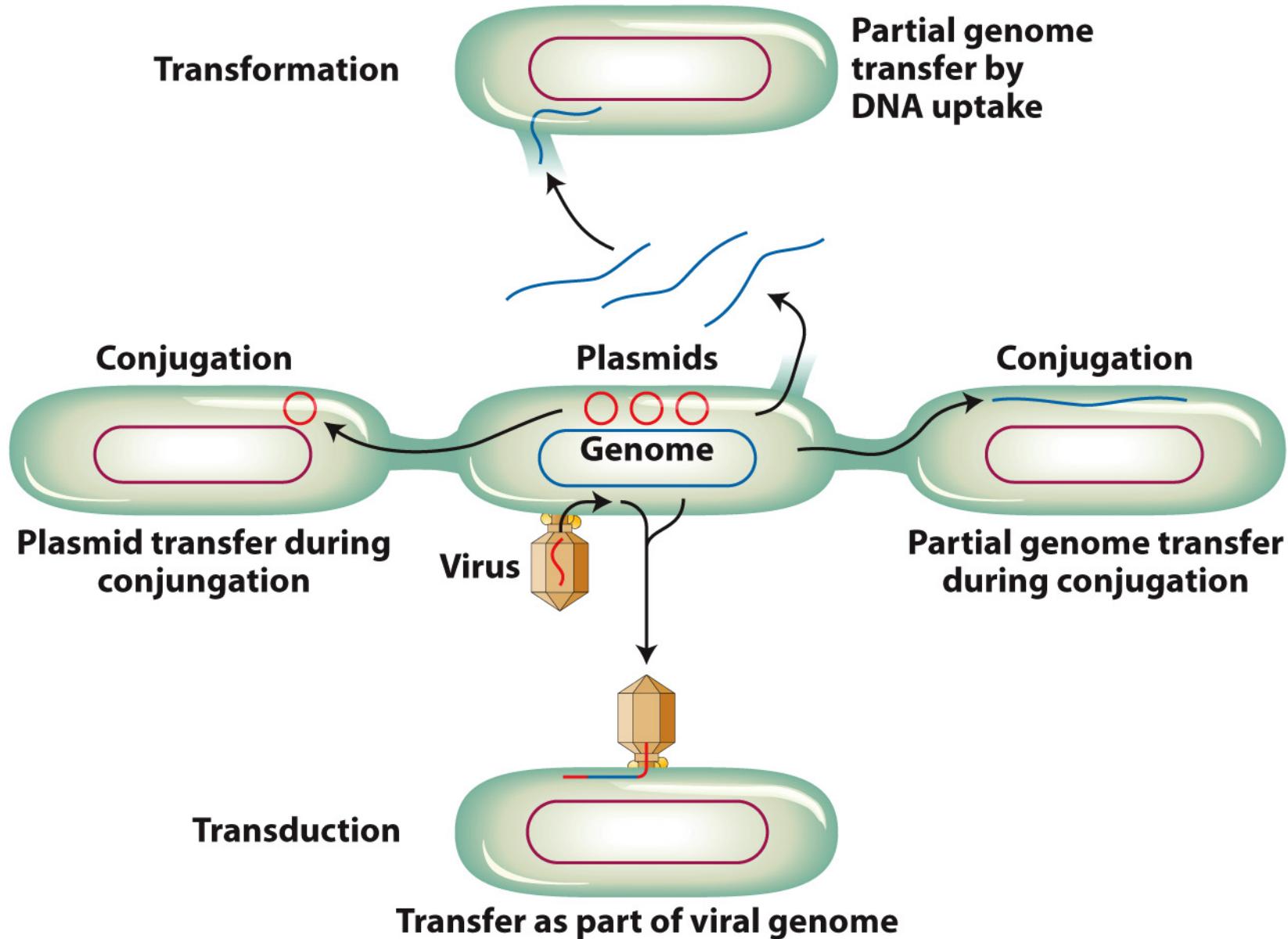


Figure 5-2

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TABLE 5-1 Some Genotypic Symbols Used in Bacterial Genetics

Symbol	Character or phenotype associated with symbol
<i>bio</i> ⁻	Requires biotin added as a supplement to minimal medium
<i>arg</i> ⁻	Requires arginine added as a supplement to minimal medium
<i>met</i> ⁻	Requires methionine added as a supplement to minimal medium
<i>lac</i> ⁻	Cannot utilize lactose as a carbon source
<i>gal</i> ⁻	Cannot utilize galactose as a carbon source
<i>str</i> ^r	Resistant to the antibiotic streptomycin
<i>str</i> ^s	Sensitive to the antibiotic streptomycin

Note: Minimal medium is the basic synthetic medium for bacterial growth without nutrient supplements.

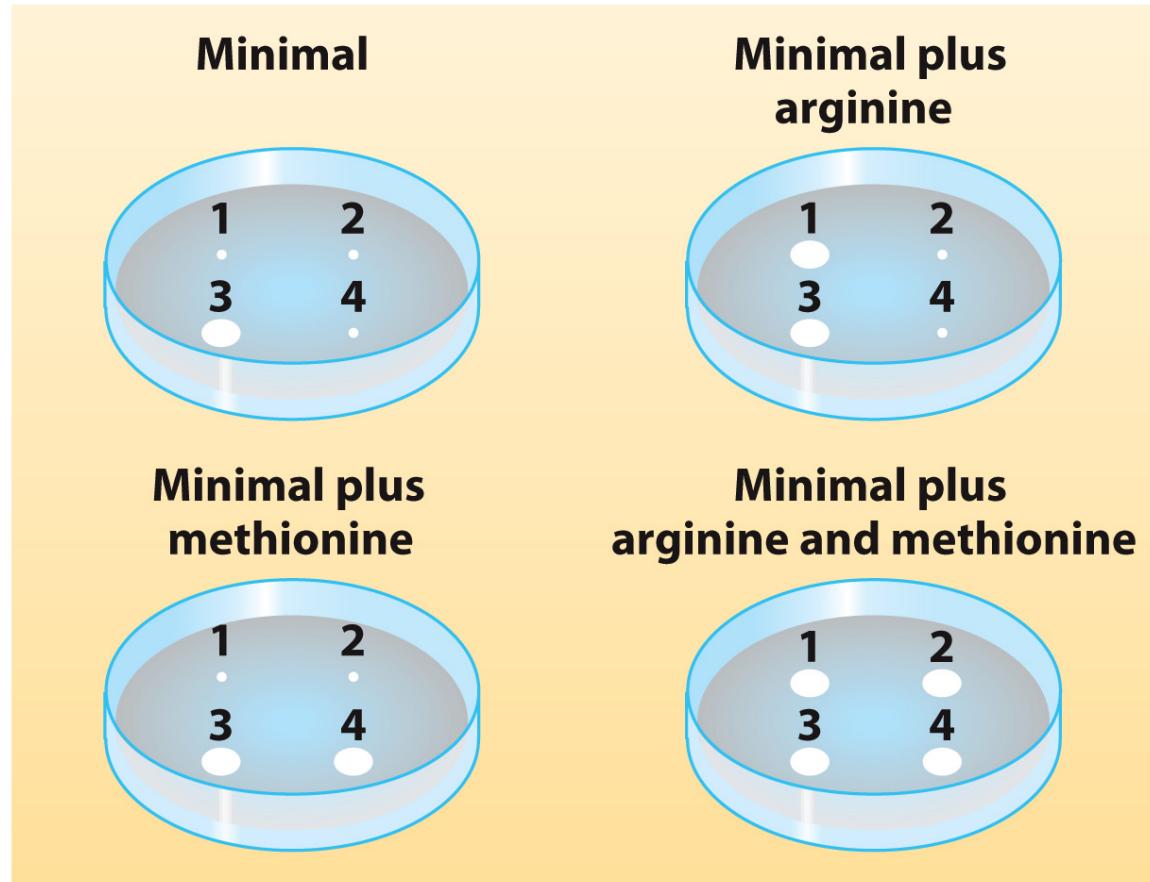
Table 5-1

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Problem 5-40

Deduce the genotypes of the following *E. coli* strains:



Problem 5-40
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Mixing bacterial genotypes produces rare recombinants

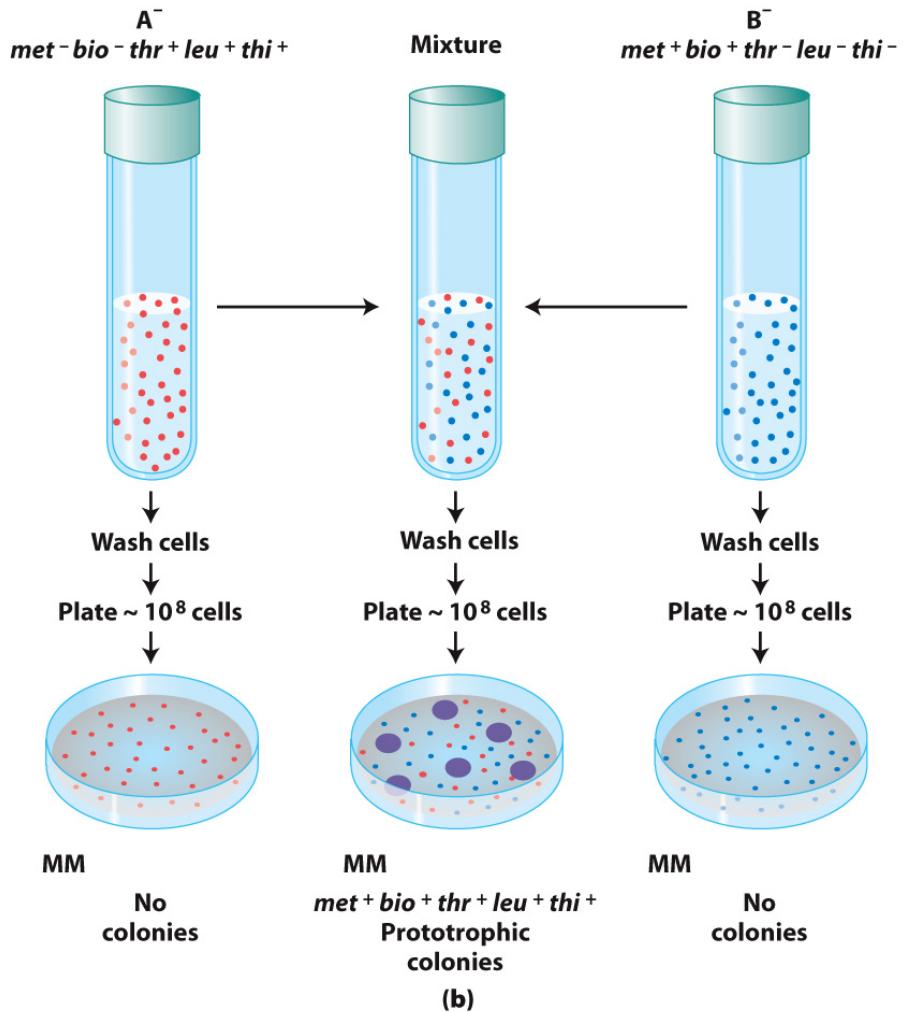
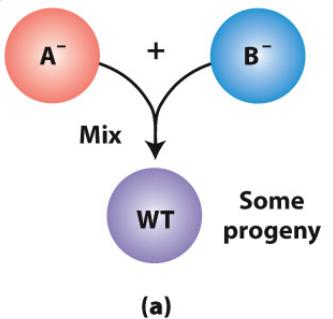


Figure 5-5
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F plasmids transfer during conjugation

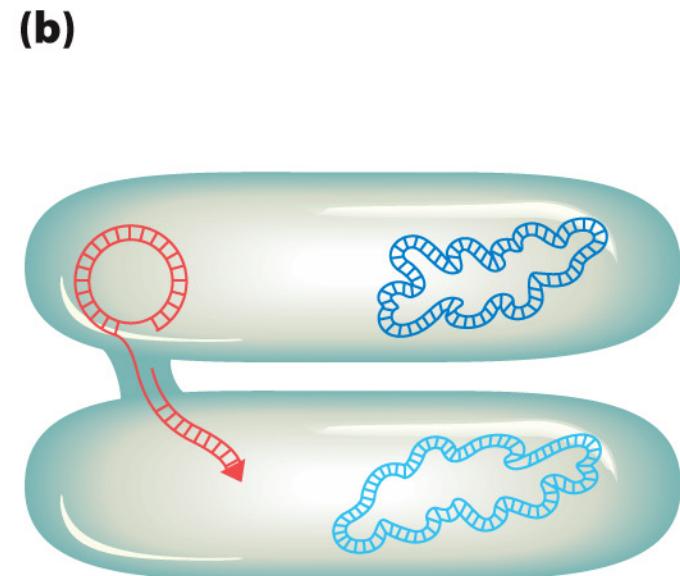
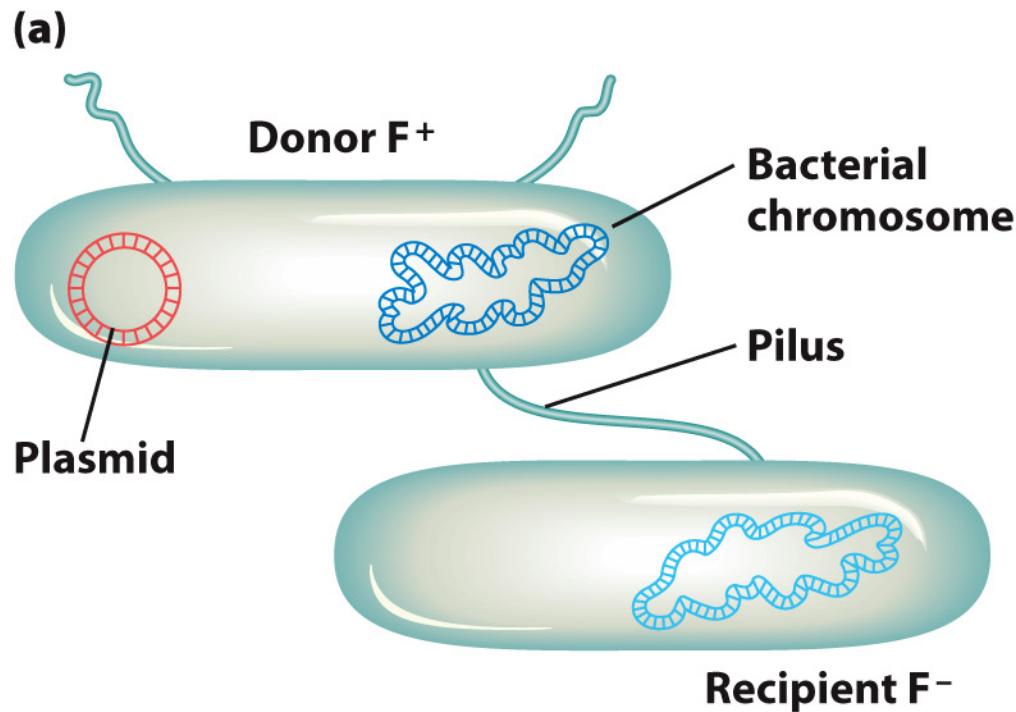


Figure 5-8

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Integration of the F plasmid creates an Hfr strain

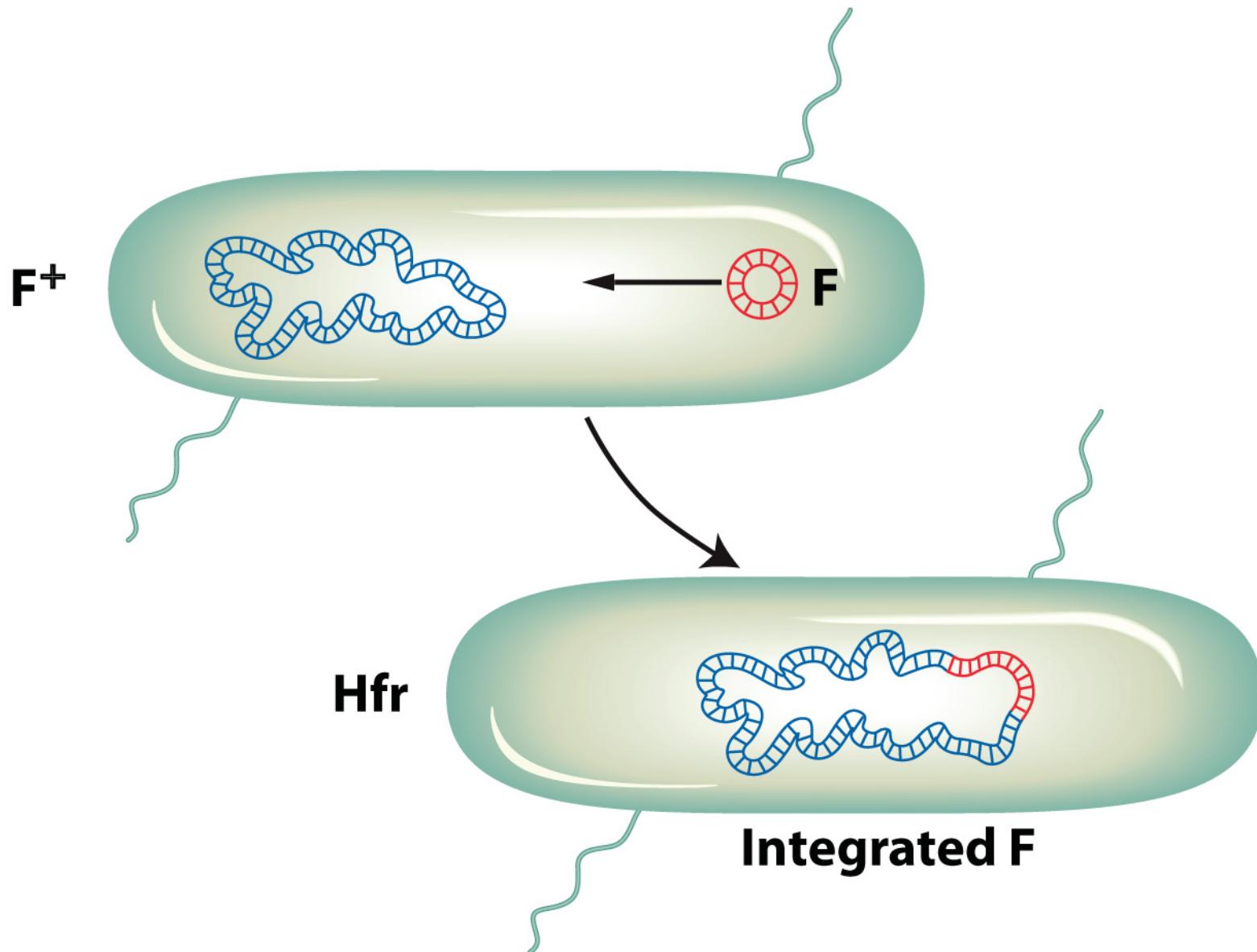


Figure 5-9

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Crossovers integrate parts of the transferred donor fragment

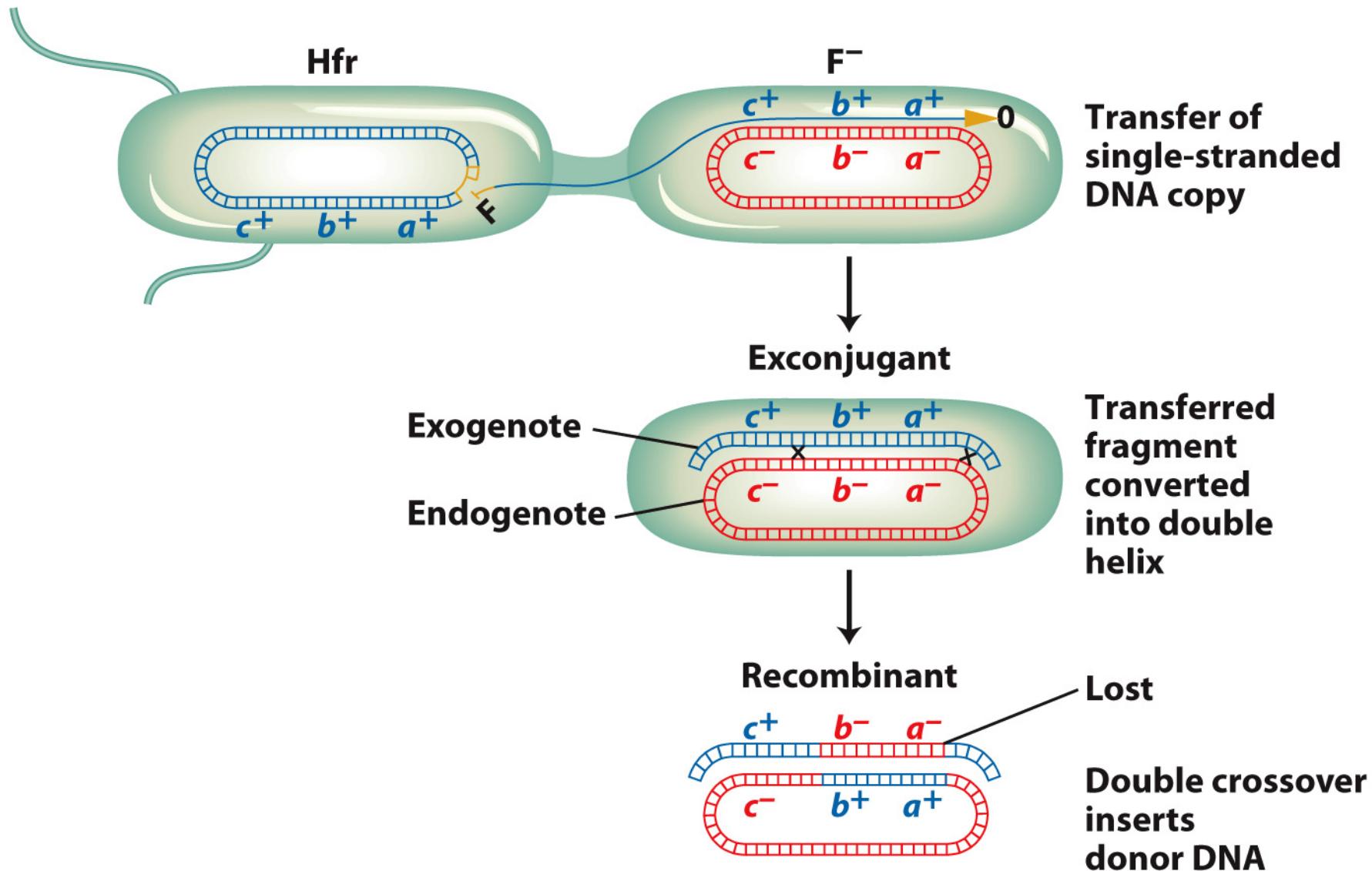


Figure 5-11

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The generation of various recombinants by crossing over in different regions

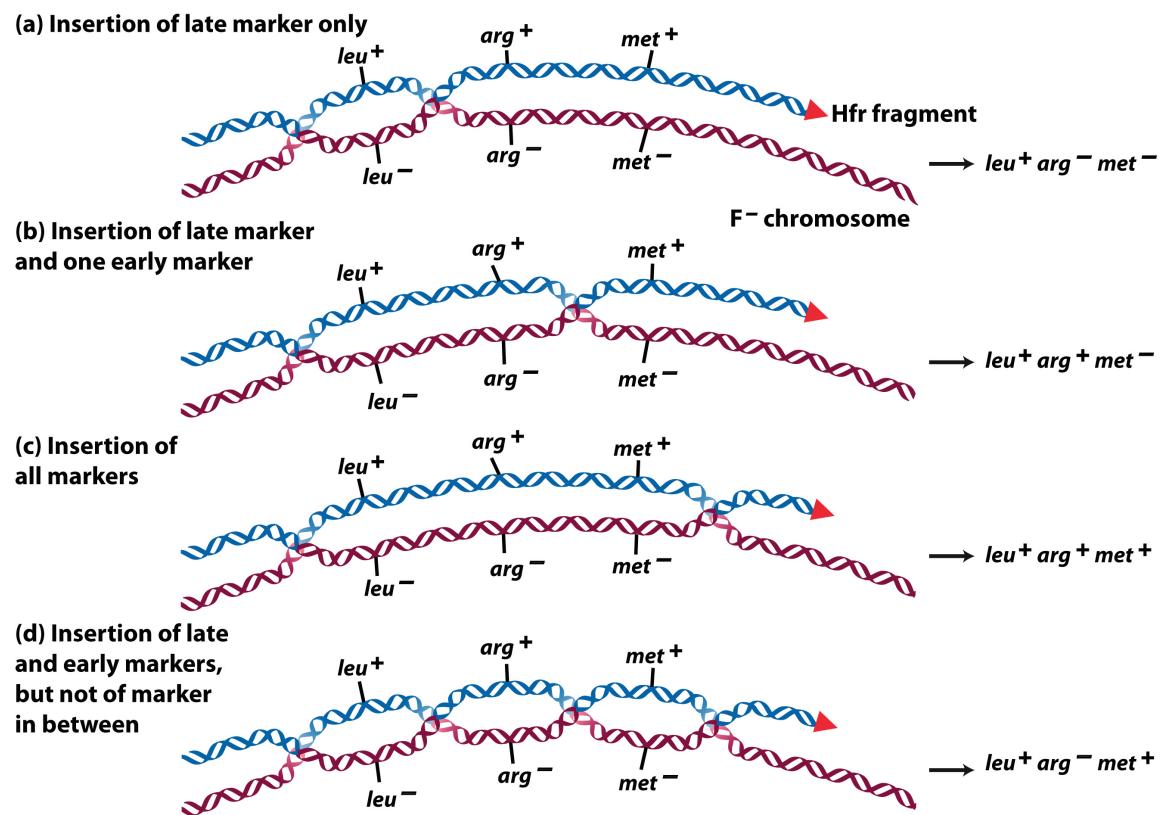


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Tracking time of marker entry generates a chromosome map

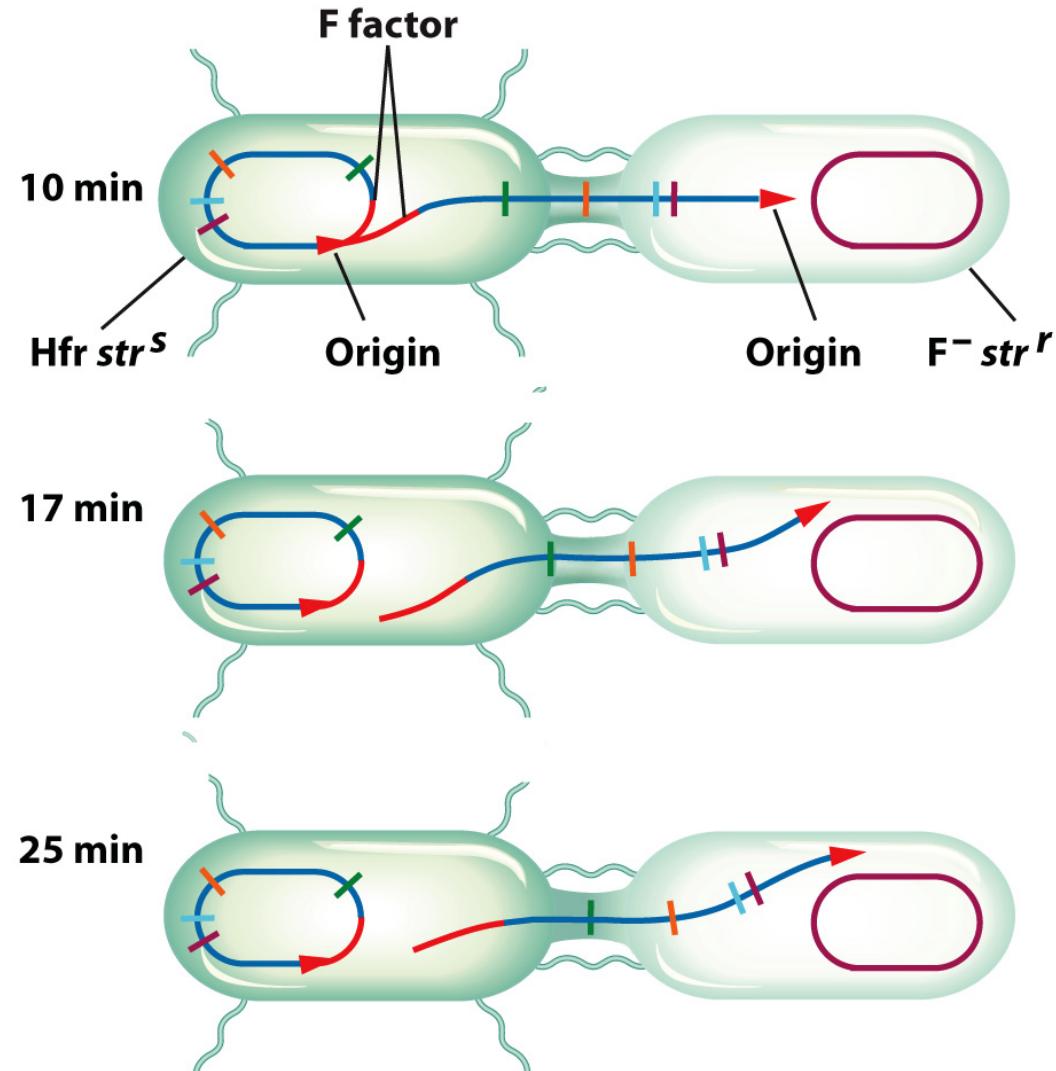


Figure 5-12b
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Tracking time of marker entry generates a chromosome map

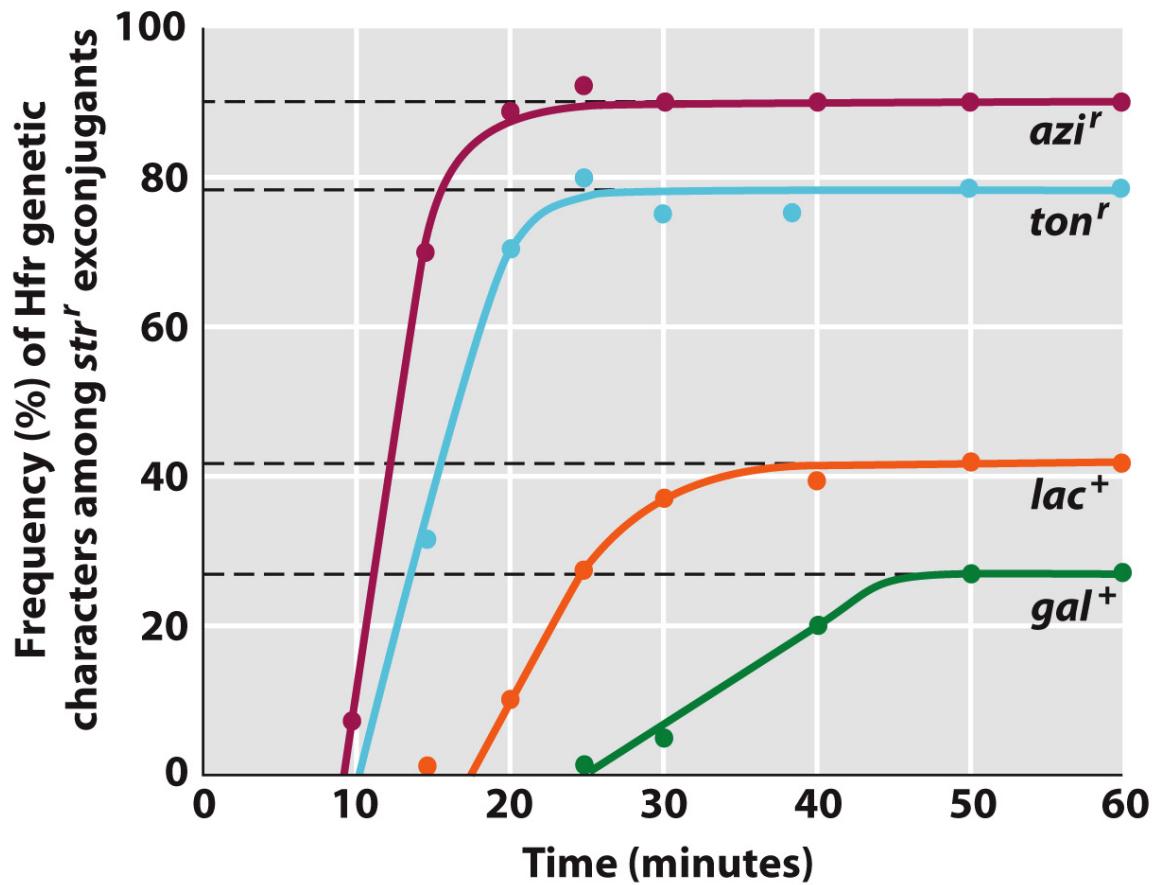


Figure 5-12a
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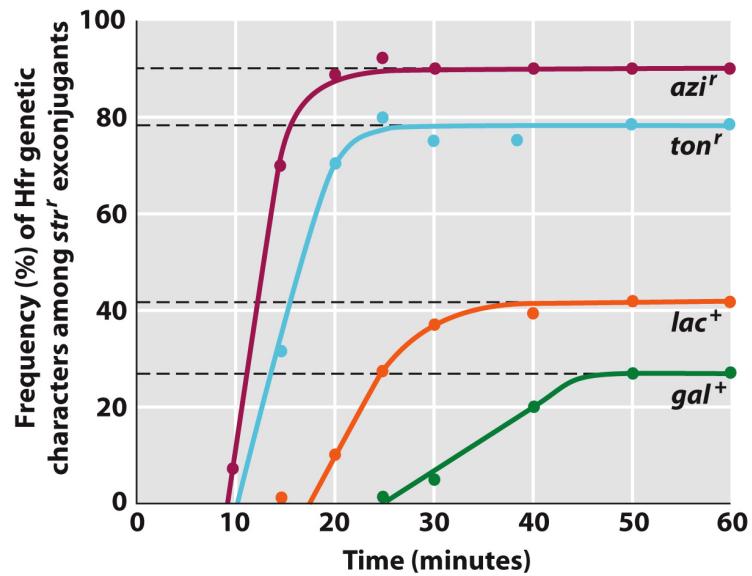


Figure 5-12a
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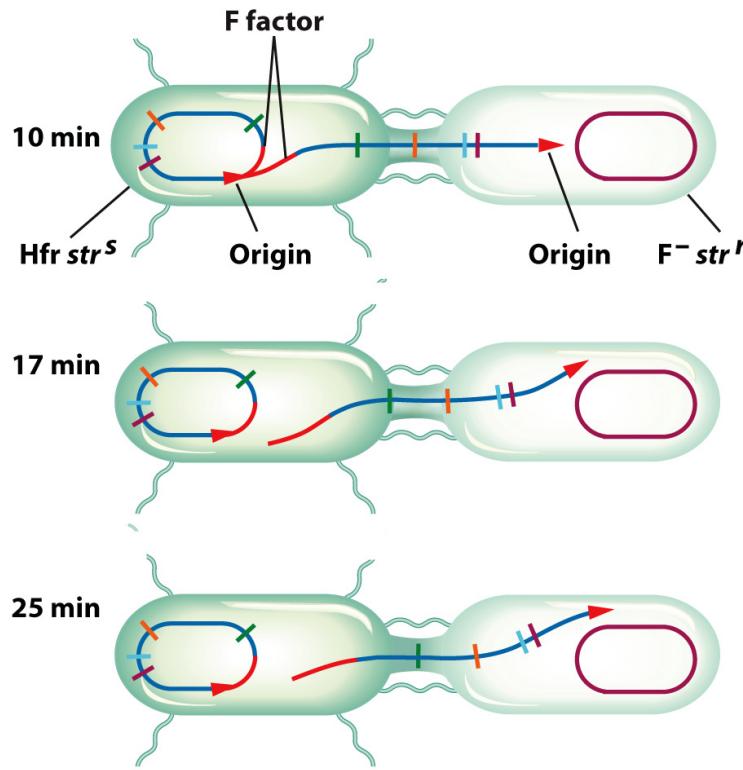


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The F integration site determines the order of gene transfer in Hfrs

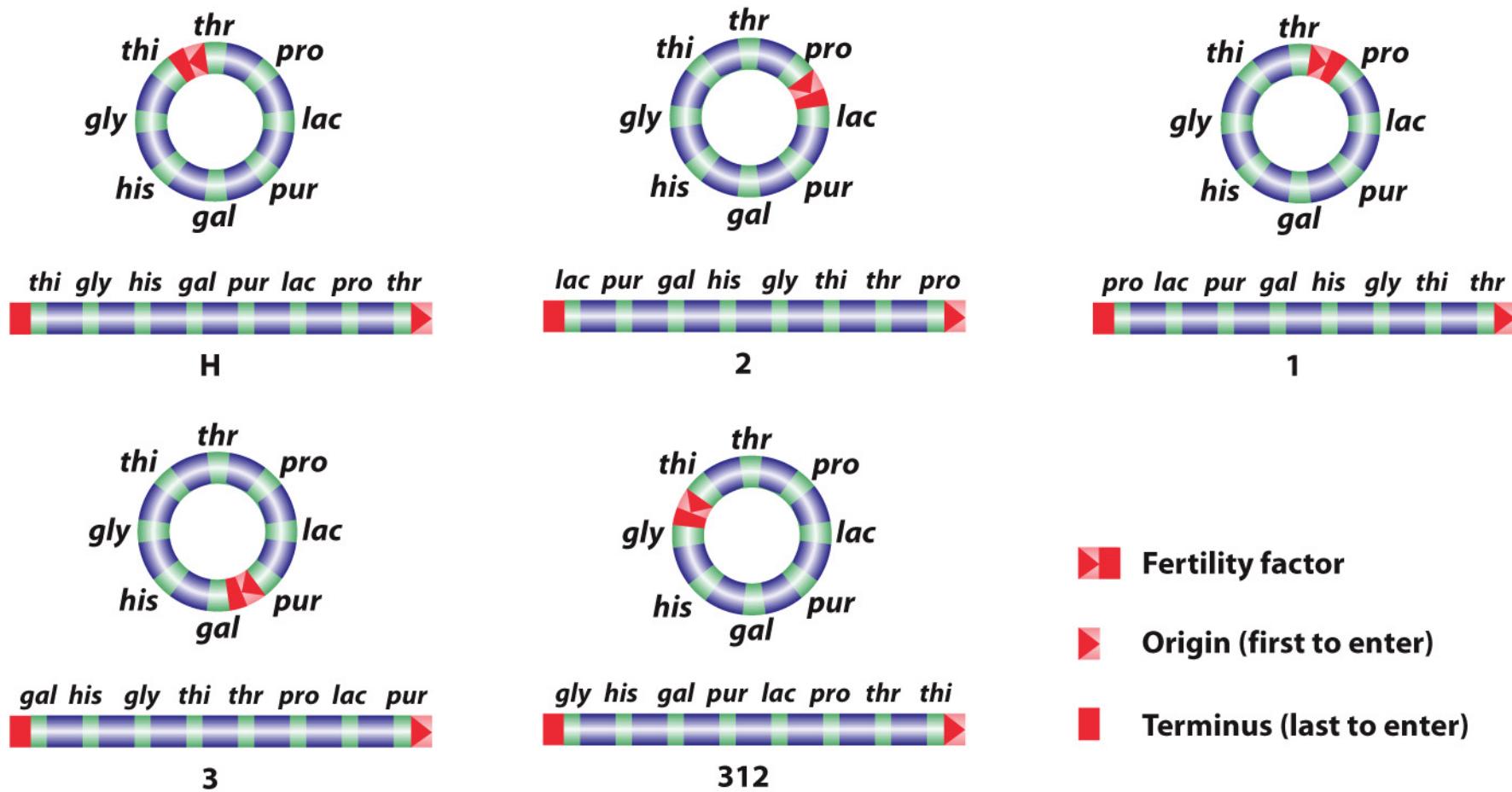


Figure 5-14

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Accompanying Markers in Specific P1 Transductions

TABLE 5-3 Accompanying Markers in Specific P1 Transductions

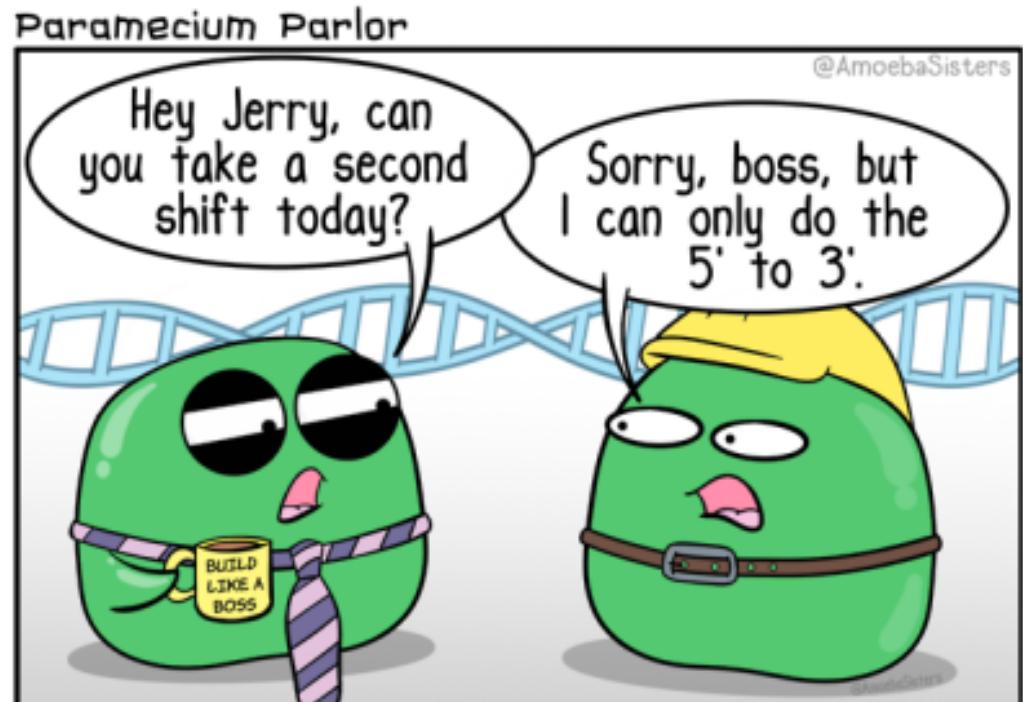
Experiment	Selected marker	Unselected markers
1	<i>leu</i> ⁺	50% are <i>azi</i>^r; 2% are <i>thr</i>⁺
2	<i>thr</i> ⁺	3% are <i>leu</i>⁺; 0% are <i>ari</i>^r
3	<i>leu</i>⁺ and <i>thr</i>⁺	0% are <i>azi</i>^r

Table 5-3

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Chapter 7: DNA Structure and Replication



No one envied the job of the DNA polymerase shift manager.

Structure of the four DNA nucleotides

Purine nucleotides

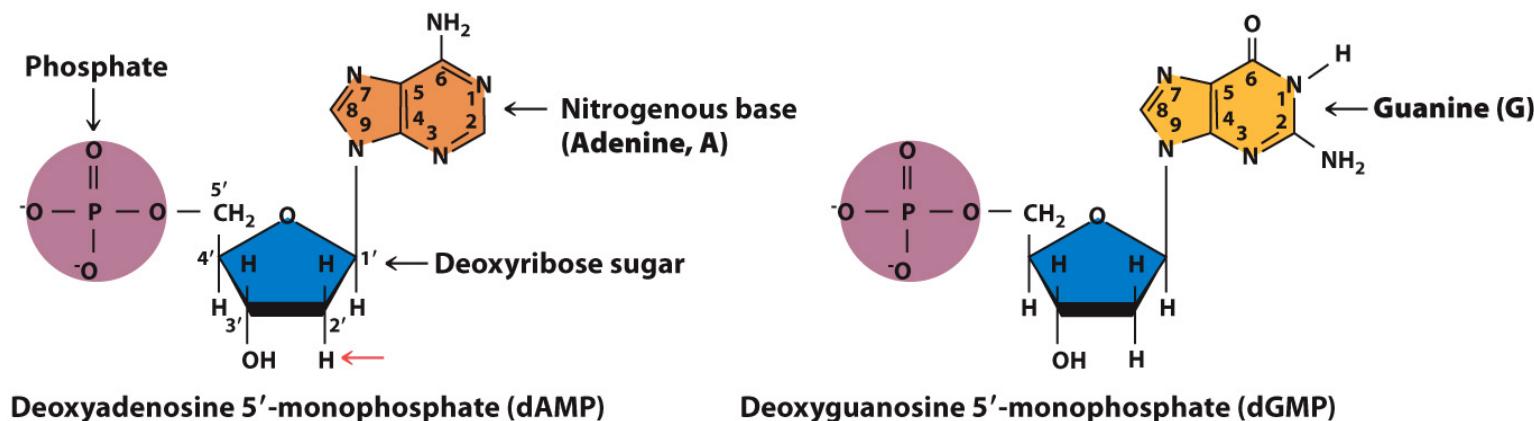


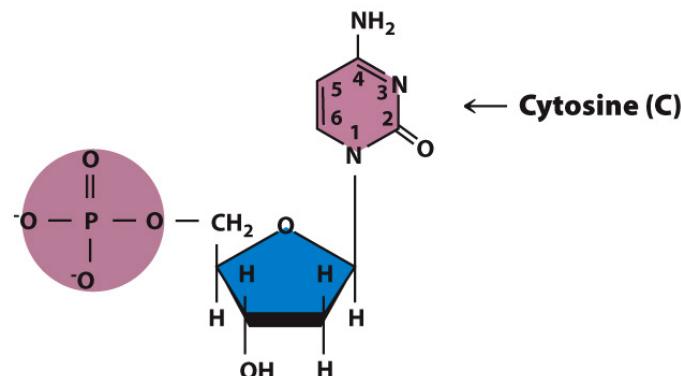
Figure 7-5 part 1

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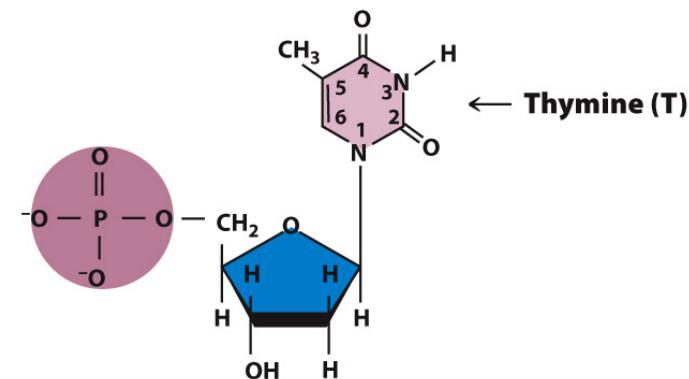
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Structure of the four DNA nucleotides

Pyrimidine nucleotides



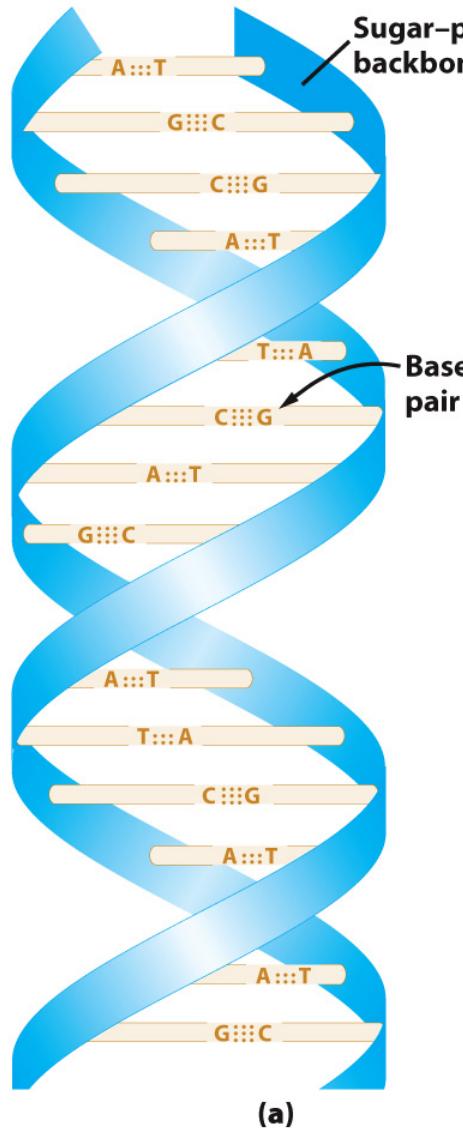
Deoxycytidine 5'-monophosphate (dCMP)



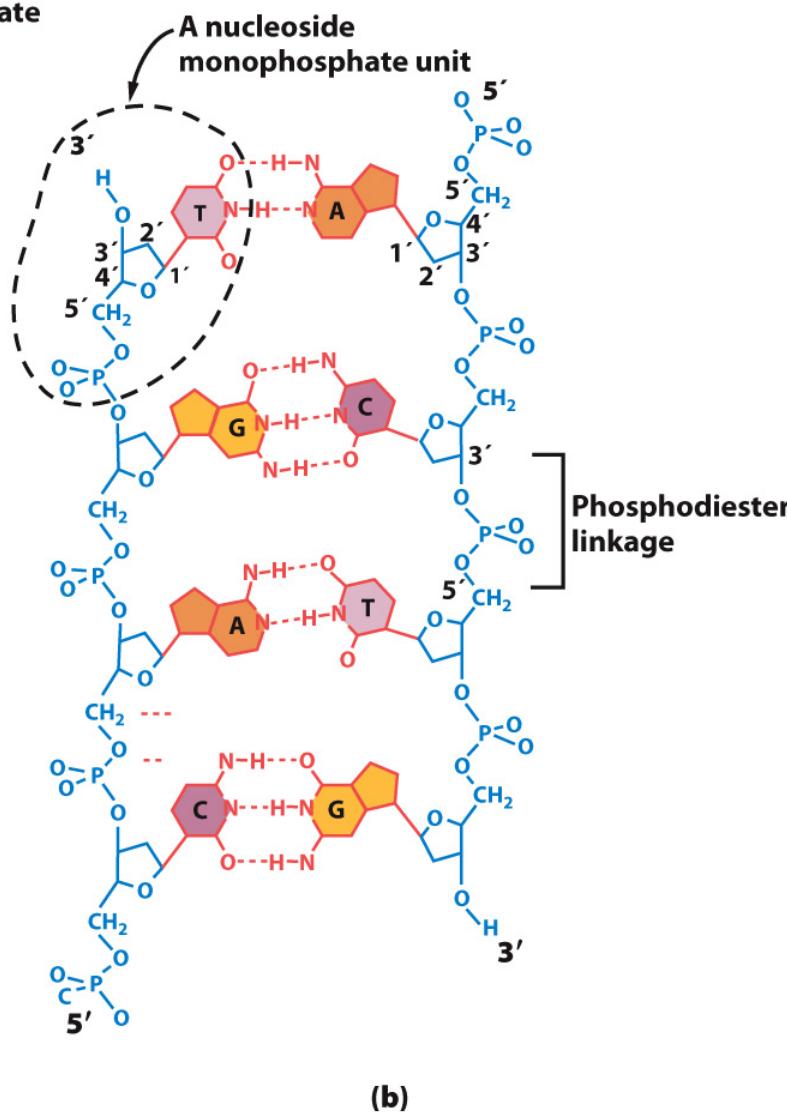
Deoxythymidine 5'-monophosphate (dTMP)

Figure 7-5 part 2

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(a)



(b)

Figure 7-8

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Three alternative models for DNA replication

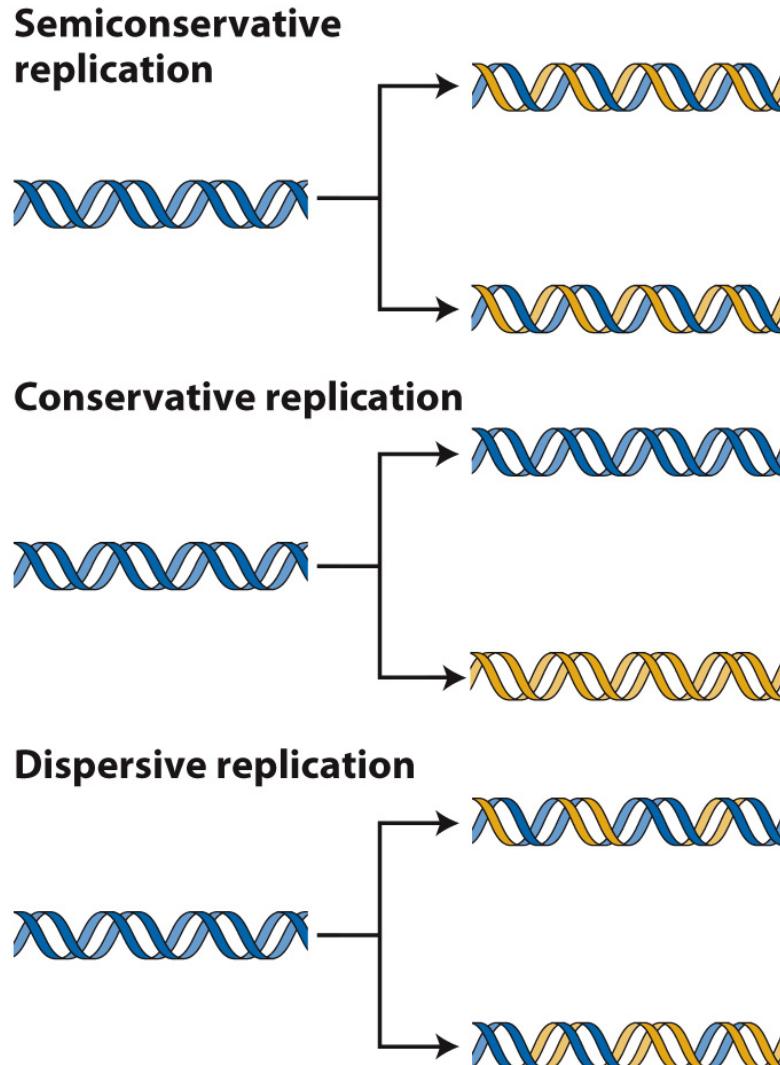
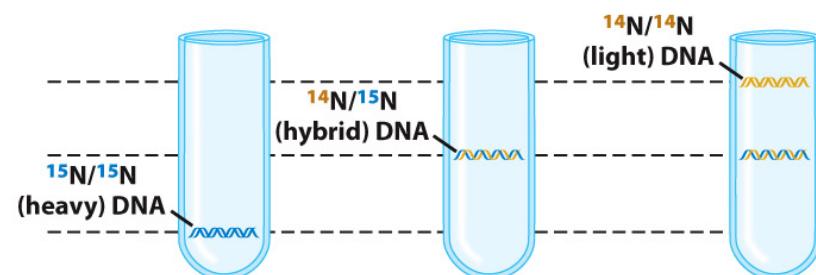
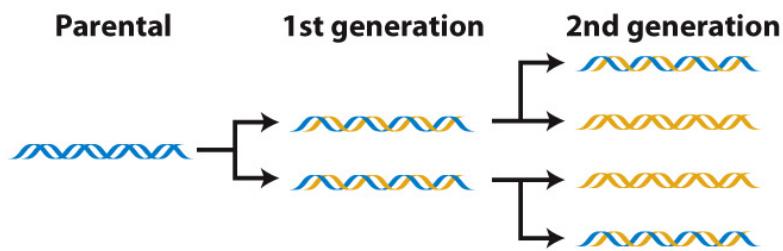
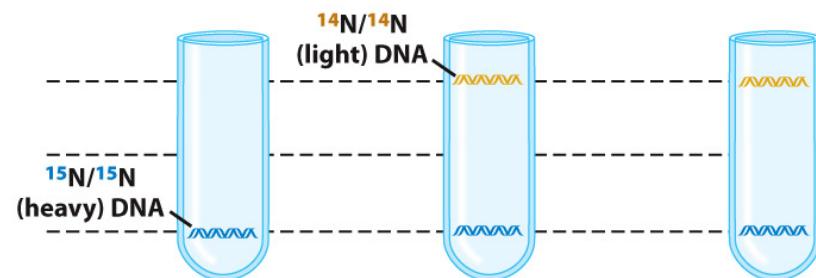
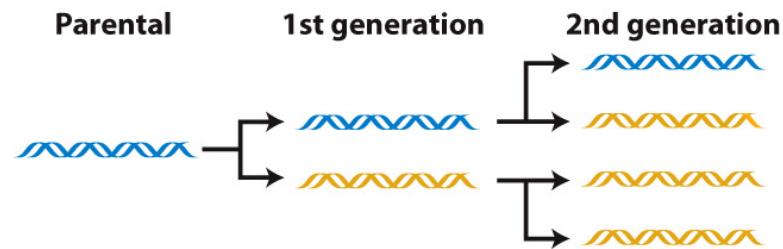


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Predictions of semiconservative model



Predictions of conservative model



Predictions of dispersive model

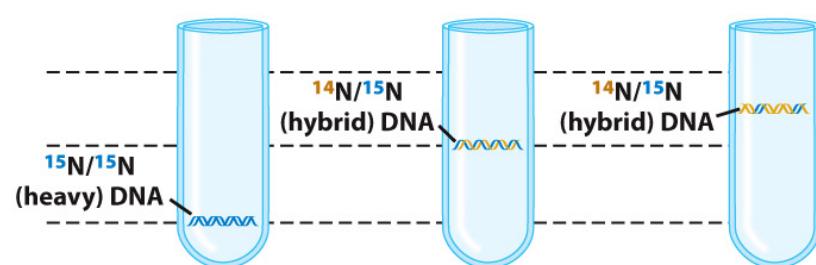
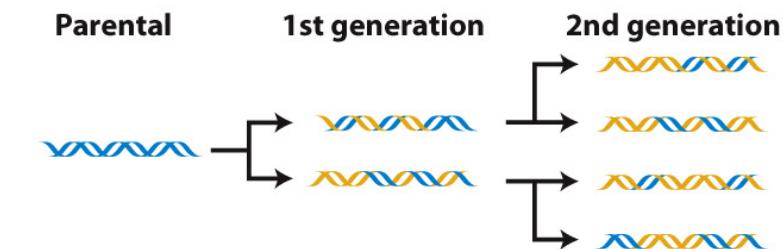


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Reaction catalyzed by DNA polymerase

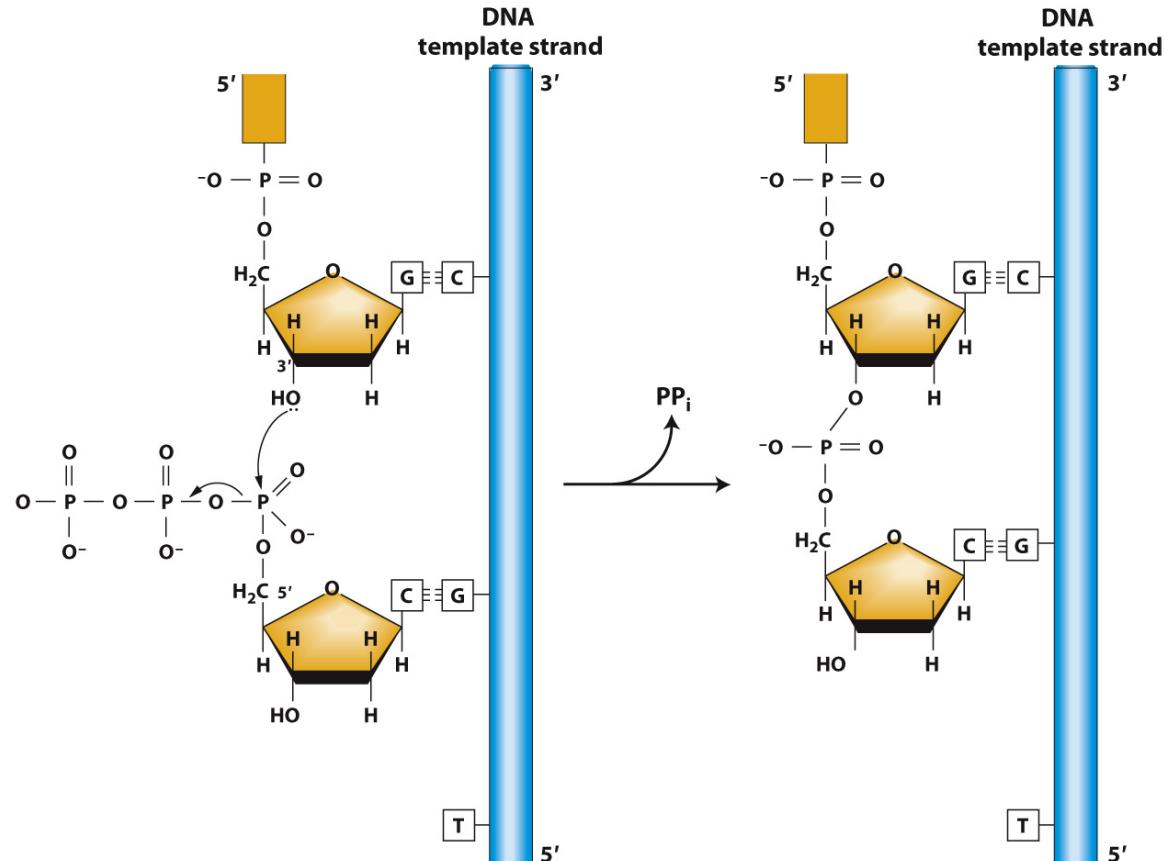


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DNA replication at the growing fork

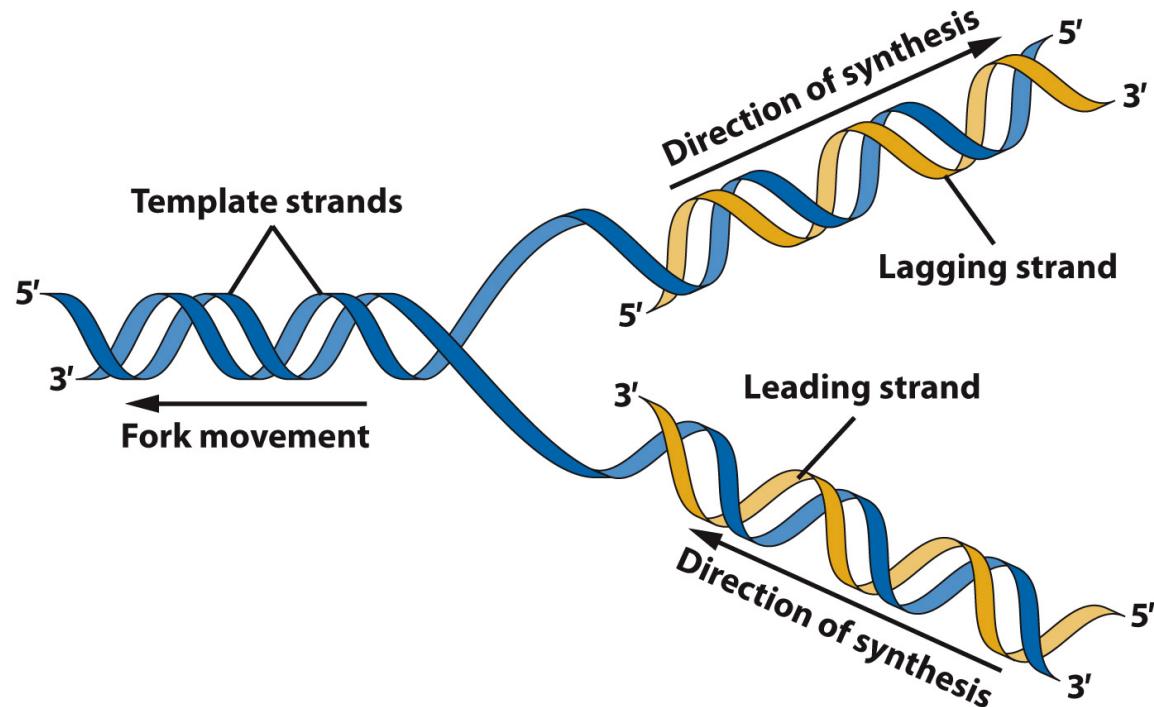


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Proteins at work at the replication fork

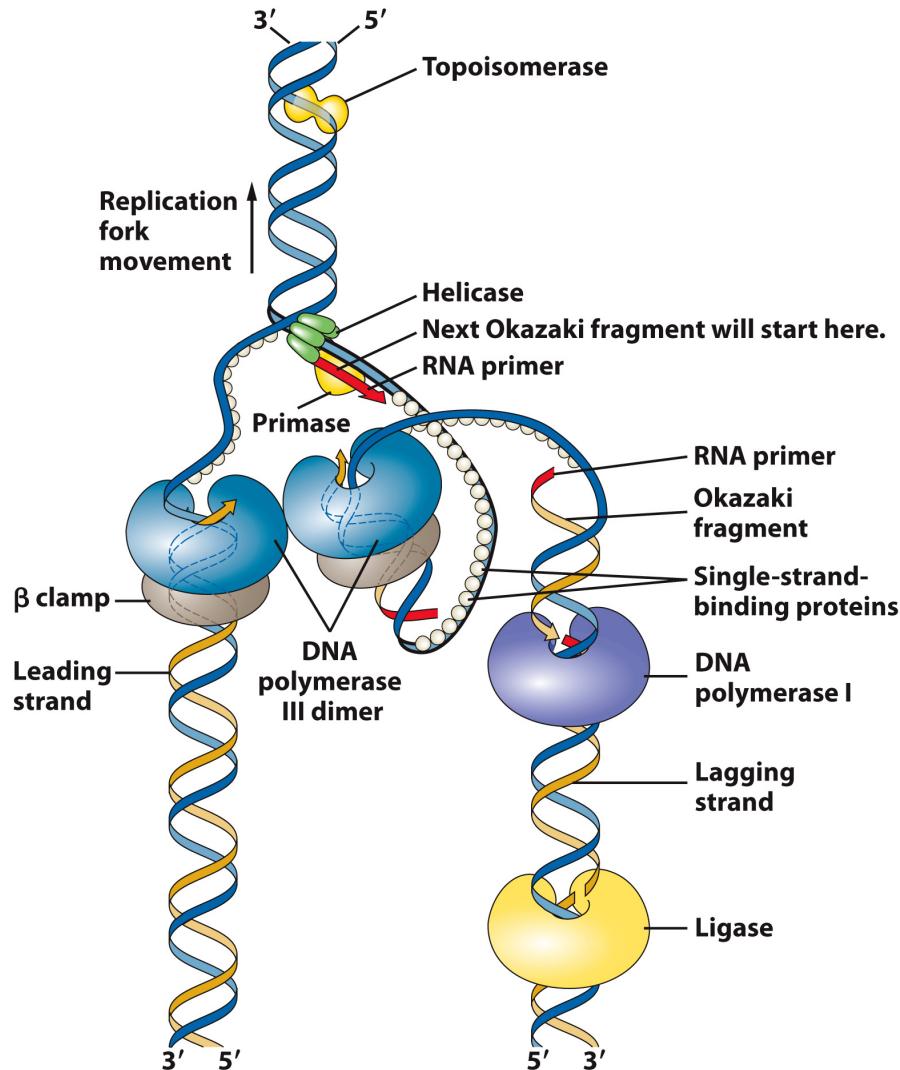


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DNA replication proceeds in two directions

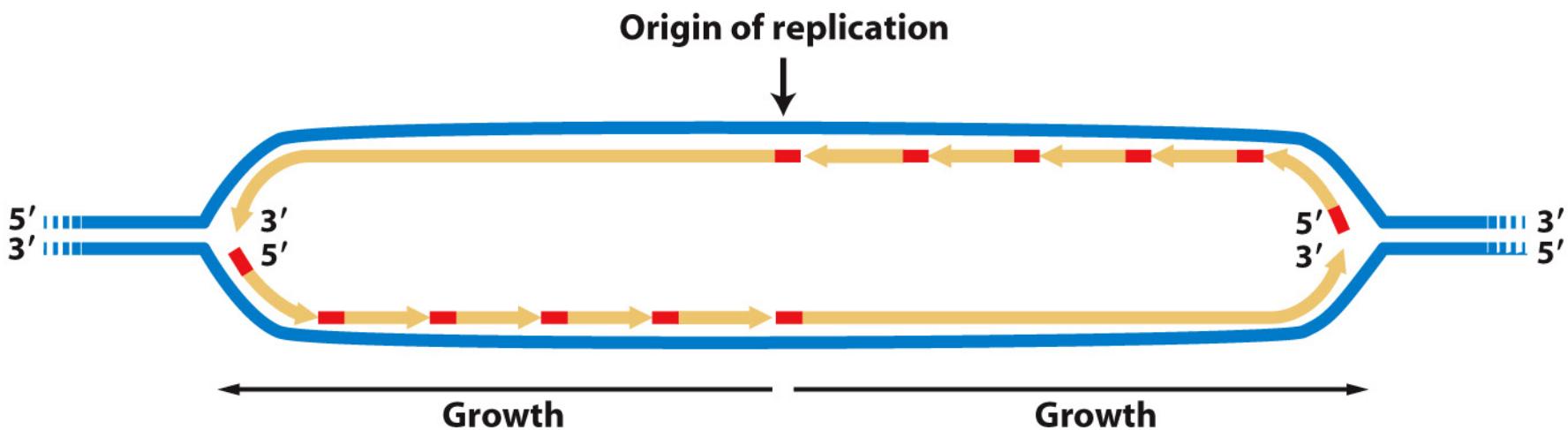


Figure 7-23a

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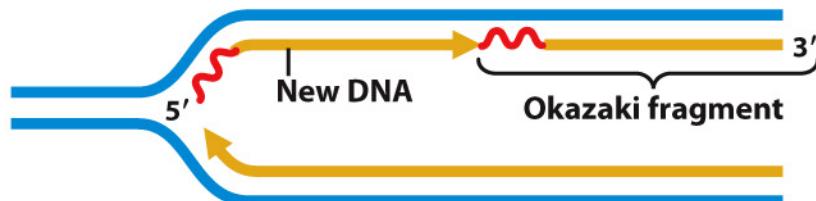
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Synthesizing the lagging strand

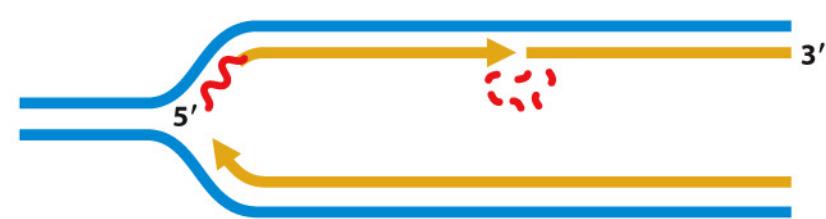
- 1. Primase synthesizes short RNA oligonucleotides (primers) copied from DNA.**



- 2. DNA polymerase III elongates RNA primers with new DNA.**



- 3. DNA polymerase I removes RNA at 5' end of neighboring fragment and fills gap.**



- 4. DNA ligase connects adjacent fragments.**



Figure 7-17

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The replication problem at chromosome ends

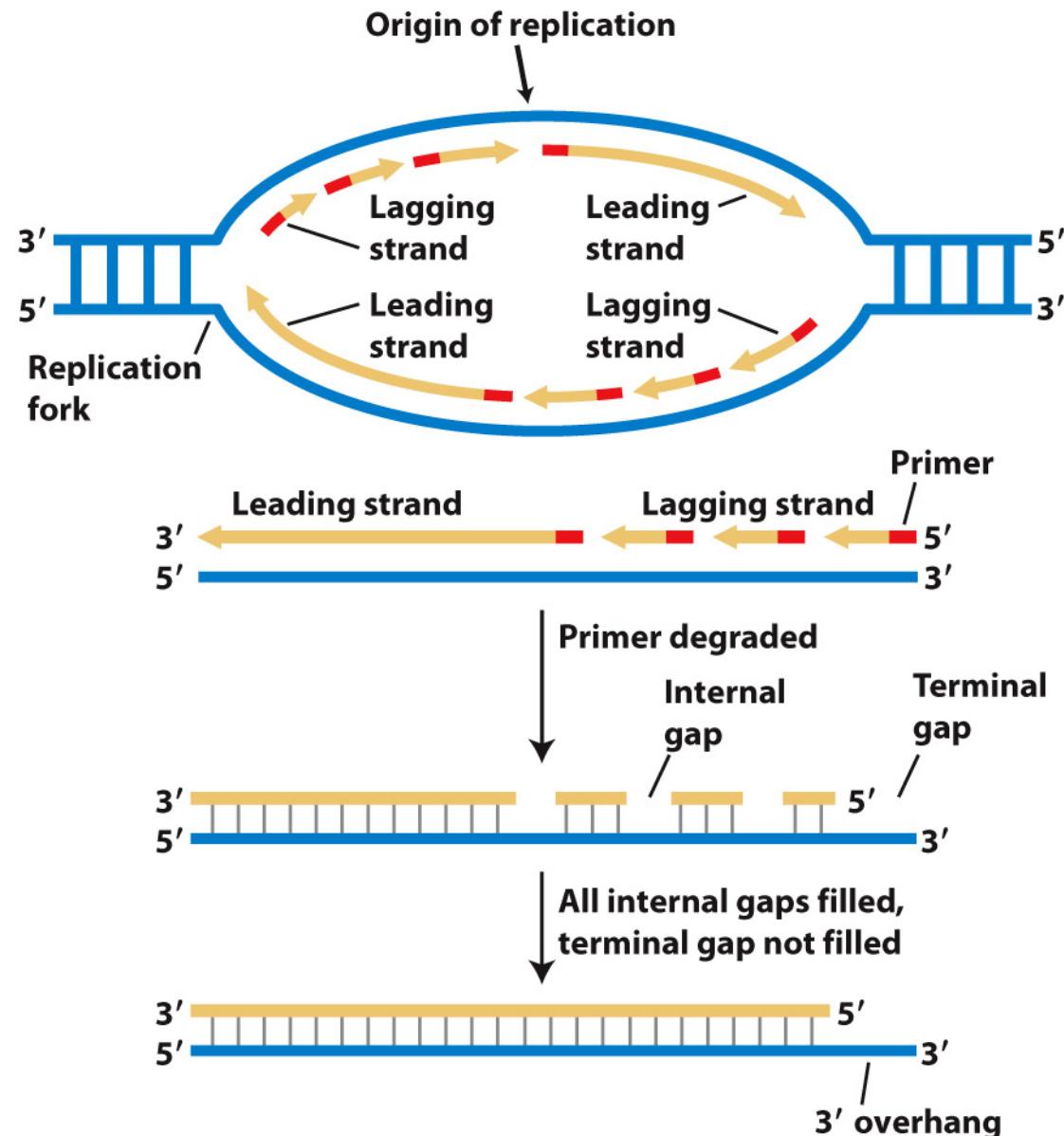


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Telomere lengthening

Lengthening of the 3' overhang

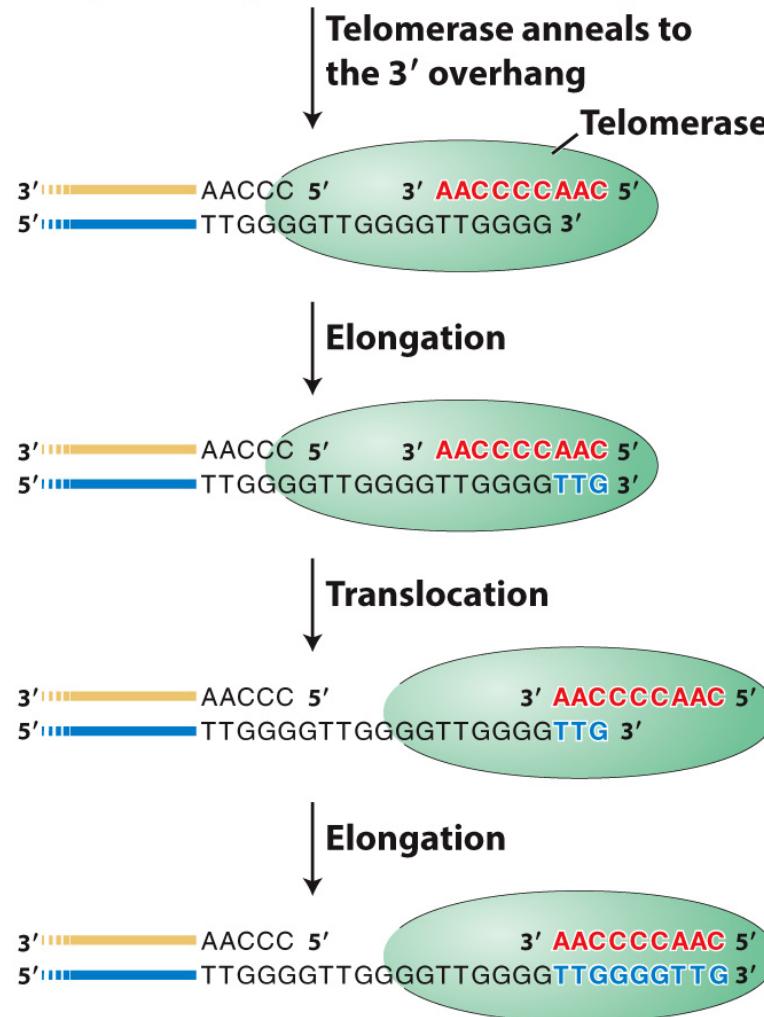


Figure 7-27a

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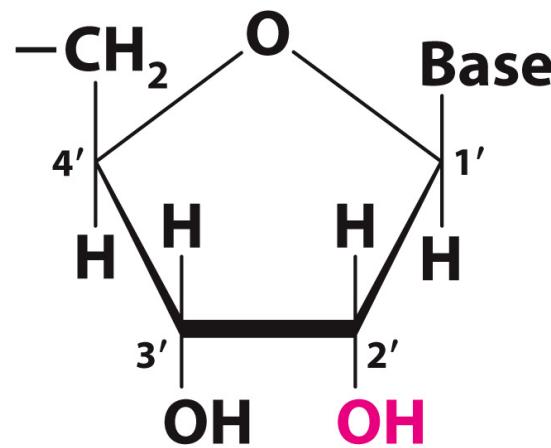


**IF I HAD TO CHOOSE BETWEEN DNA AND
RNA,**

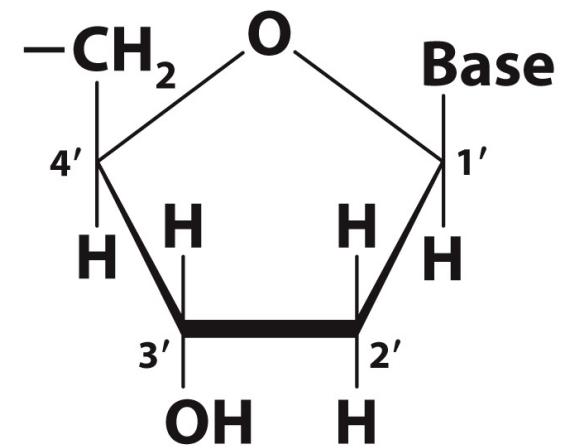
**I'D CHOOSE RNA BECAUSE IT'S GOT U IN
IT**

Chapter 8: RNA and Transcription

Deoxyribose versus ribose sugars



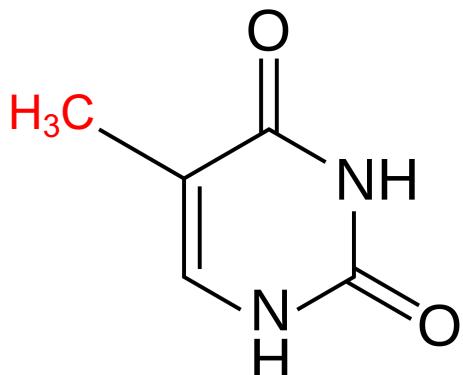
Ribose



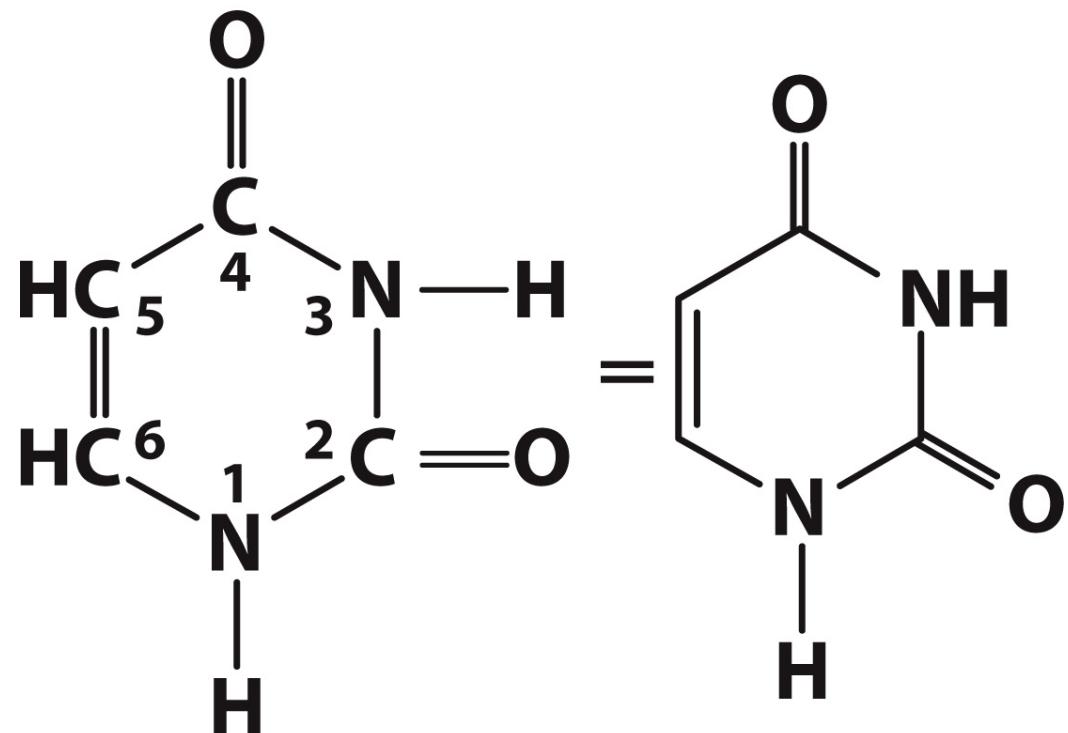
Deoxyribose

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Uracil
replaces
thymine



Thymine

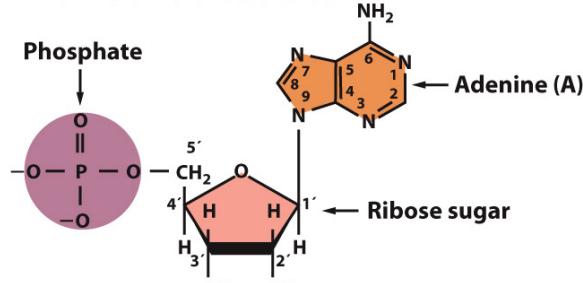


Uracil

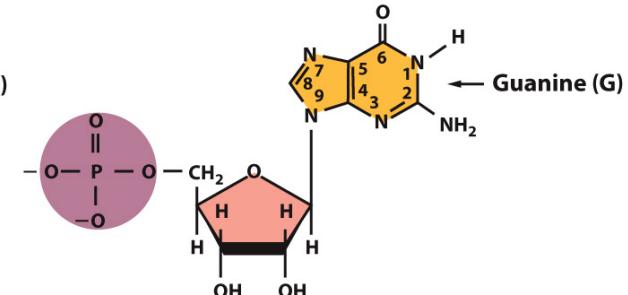
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The four ribonucleotides found in RNA

Purine ribonucleotides

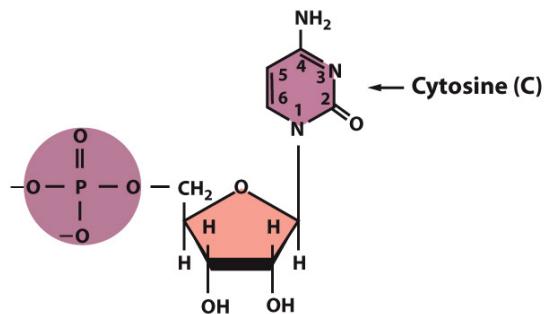


Adenosine 5'-monophosphate (AMP)

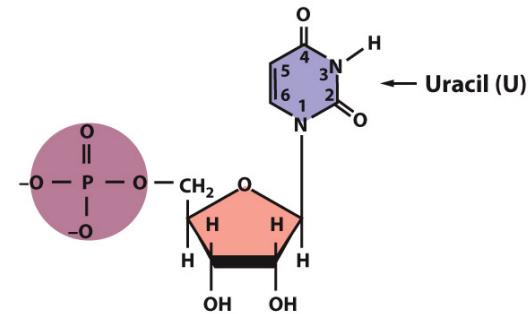


Guanosine 5'-monophosphate (GMP)

Pyrimidine ribonucleotides



Cytidine 5'-monophosphate (CMP)



Uridine 5'-monophosphate (UMP)

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Sequences of DNA and transcribed RNA

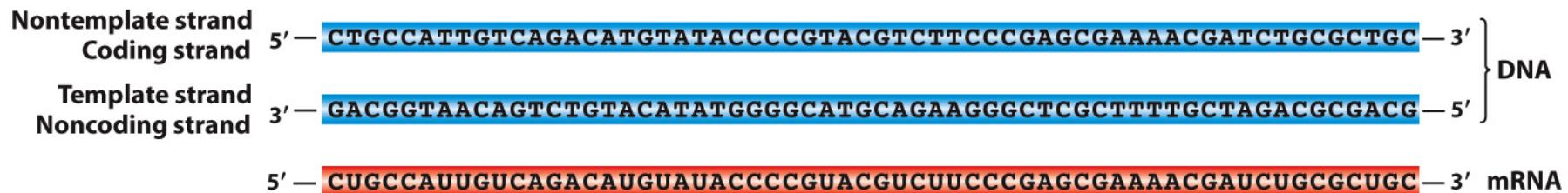


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Overview of transcription

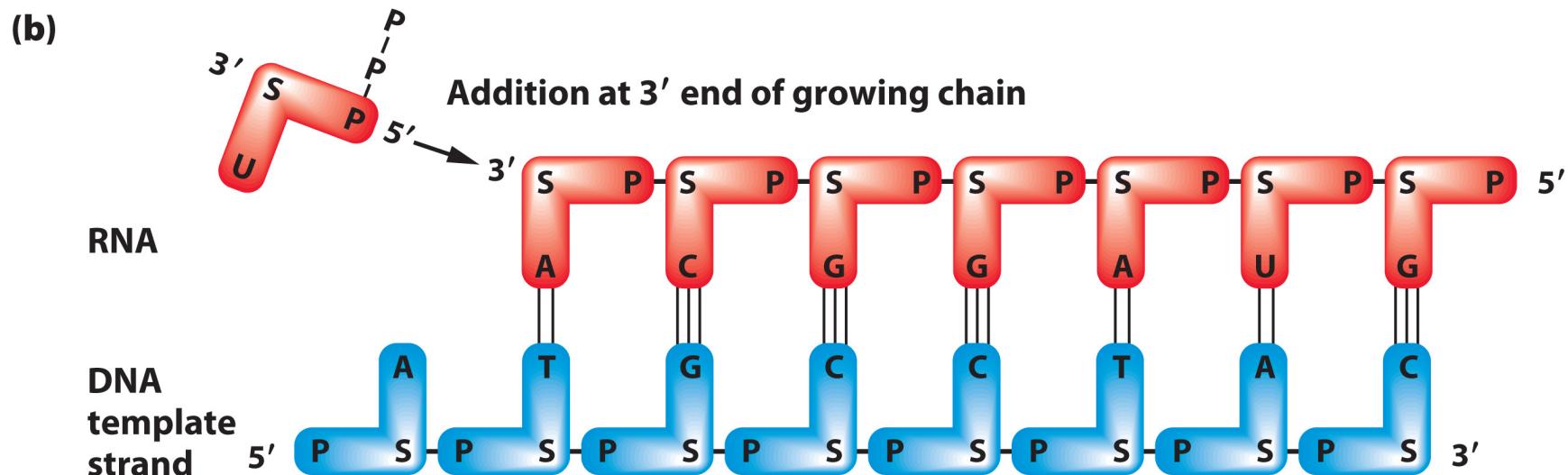
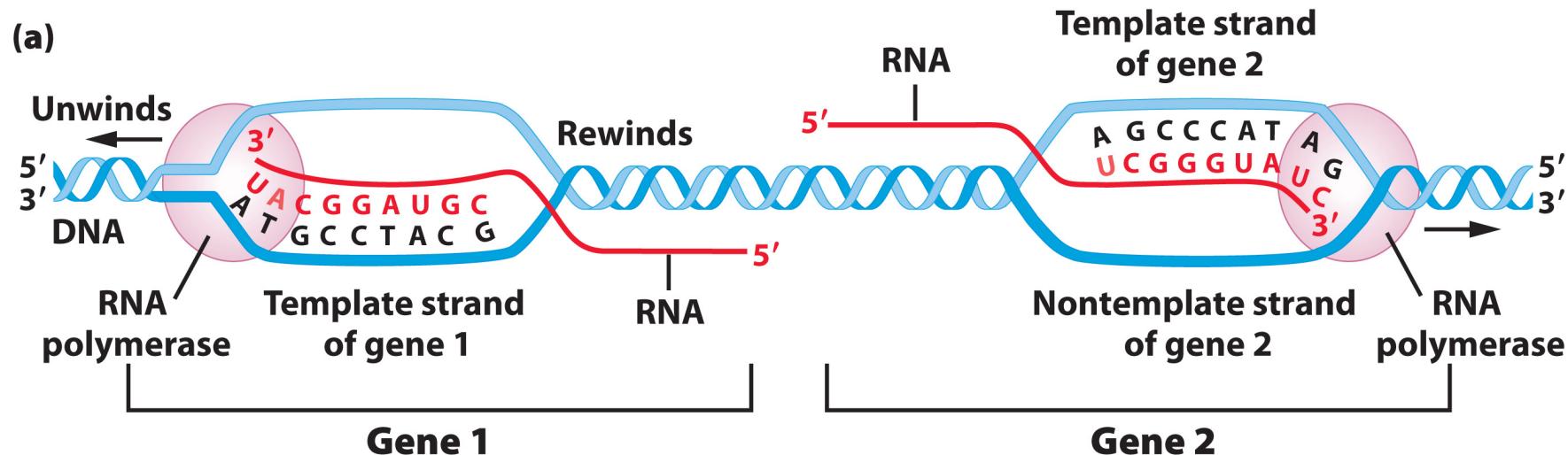
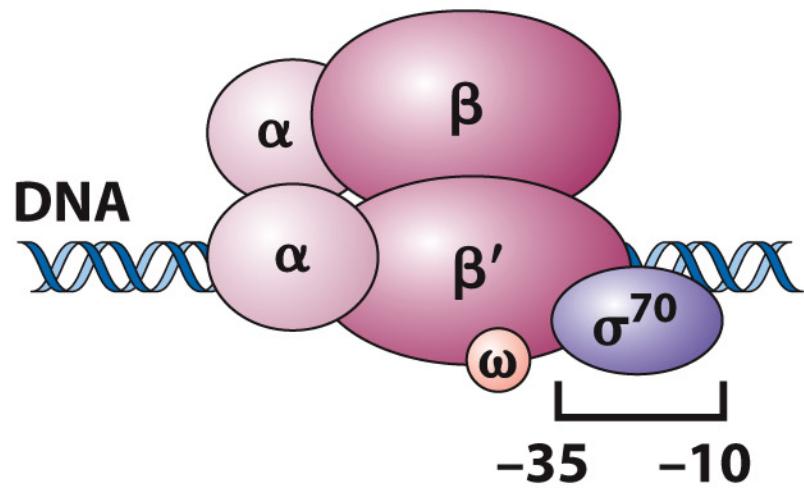


Figure 8-4

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Transcription initiation in prokaryotes

(a) RNA polymerase binding to promoter



(b) Initiation

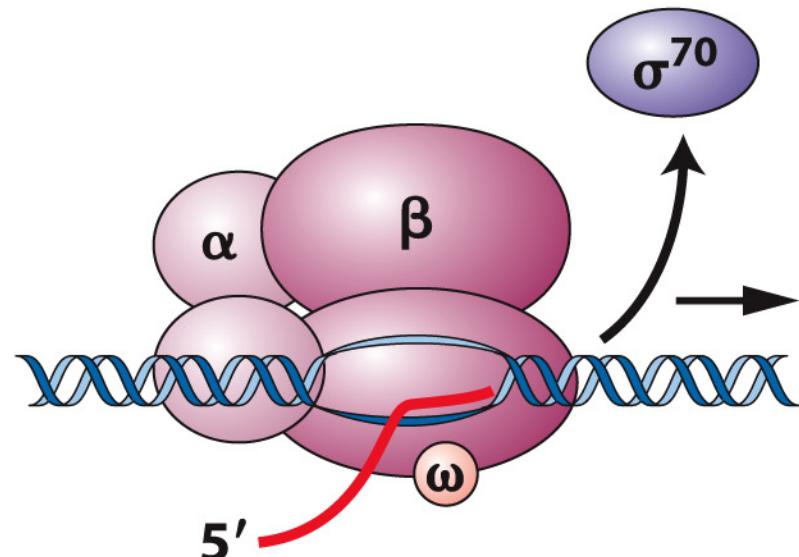


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Elongation

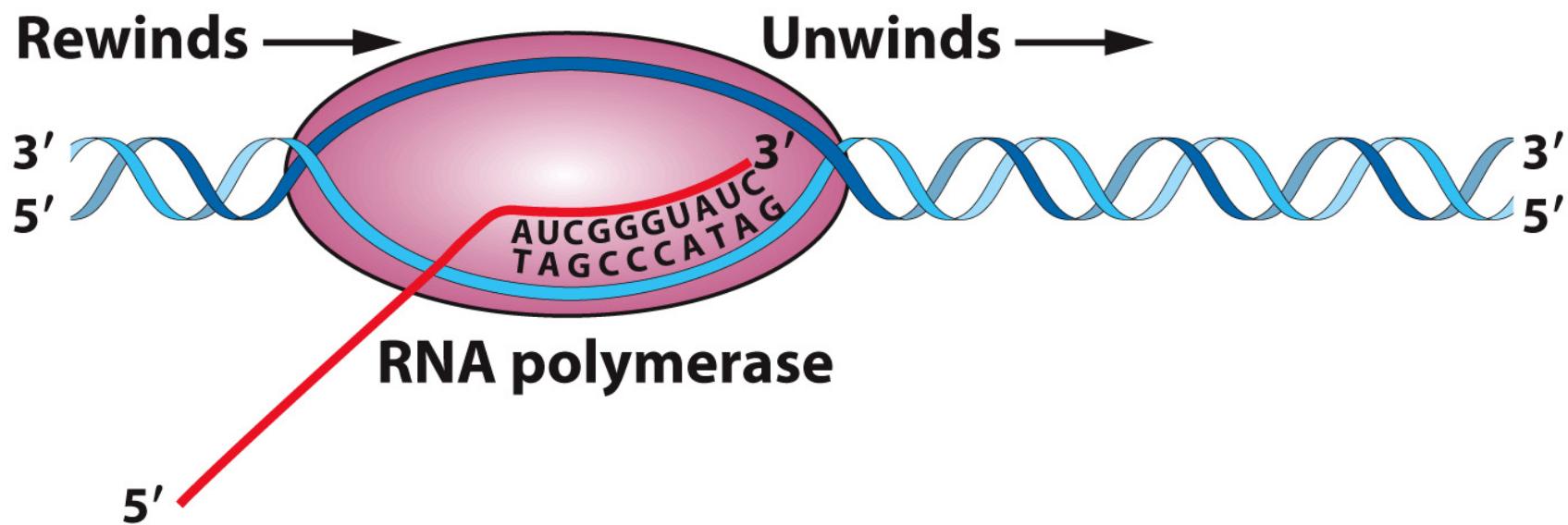


Figure 8-9a

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Termination: intrinsic mechanism

RNA being released

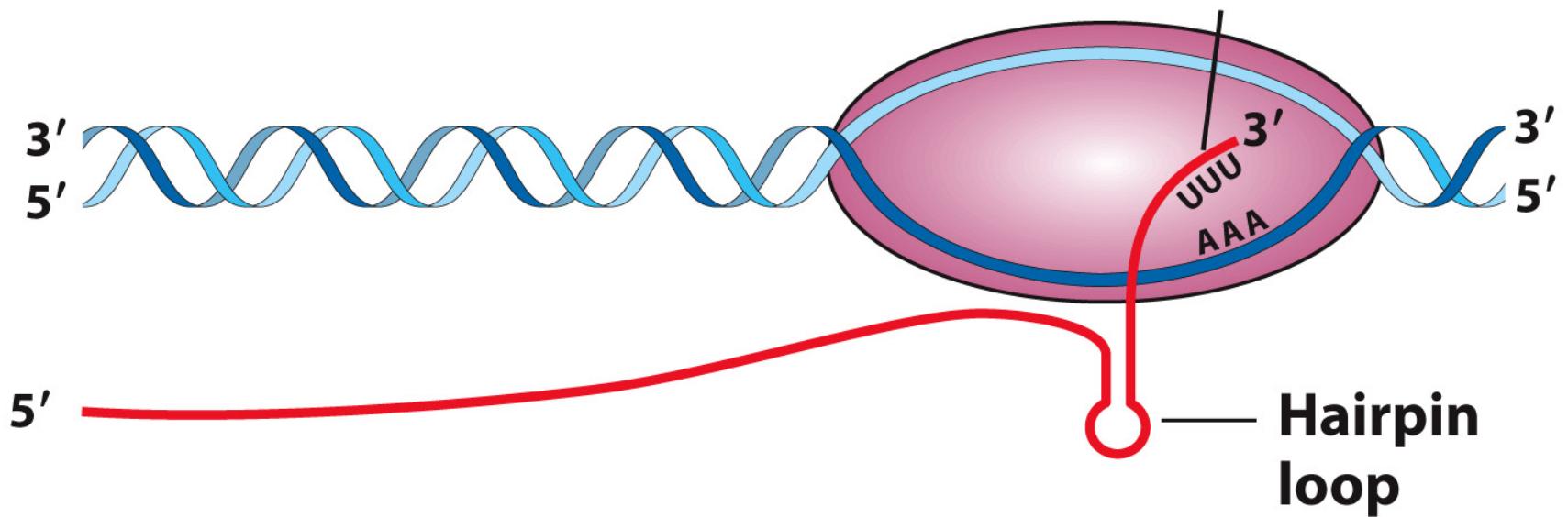


Figure 8-9b

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Transcription initiation in eukaryotes

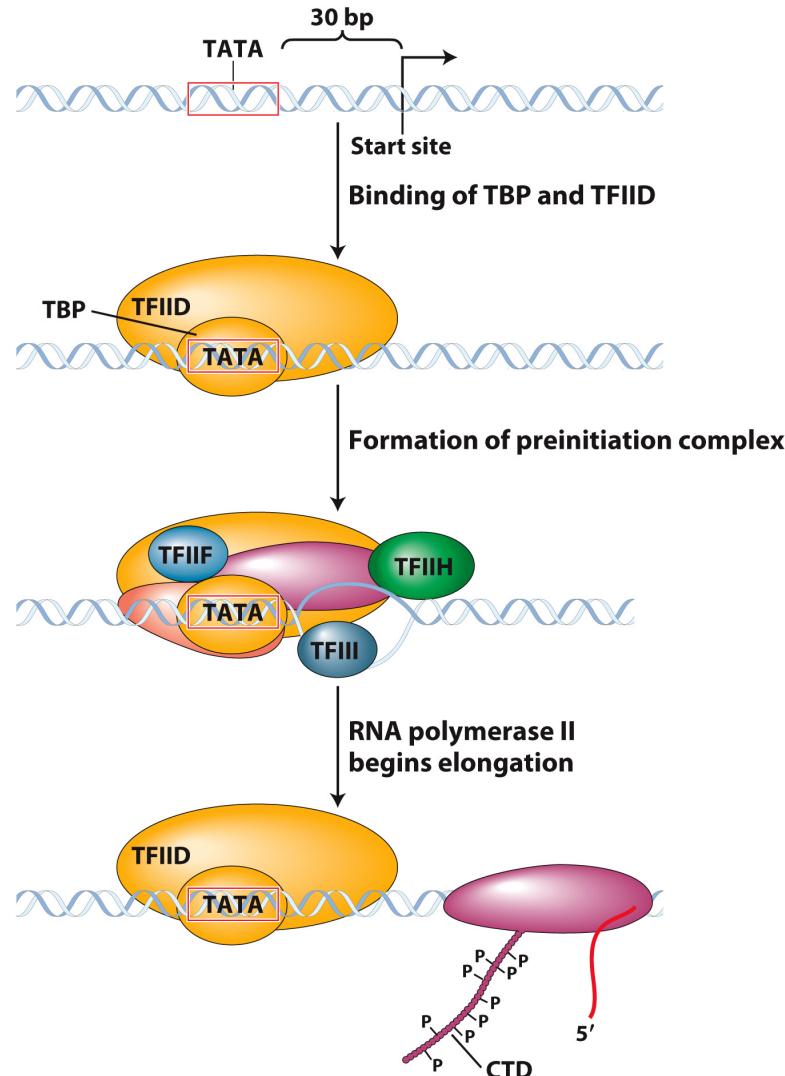


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Cotranscriptional processing of RNA

Capping

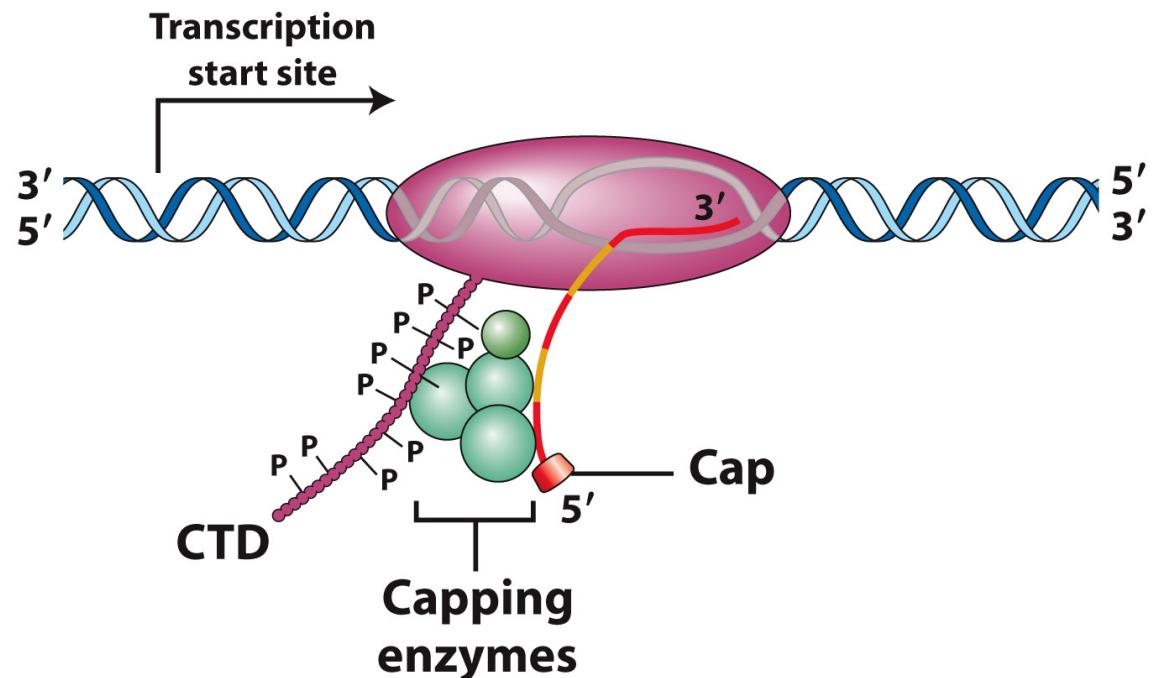


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Cotranscriptional processing of RNA

Splicing

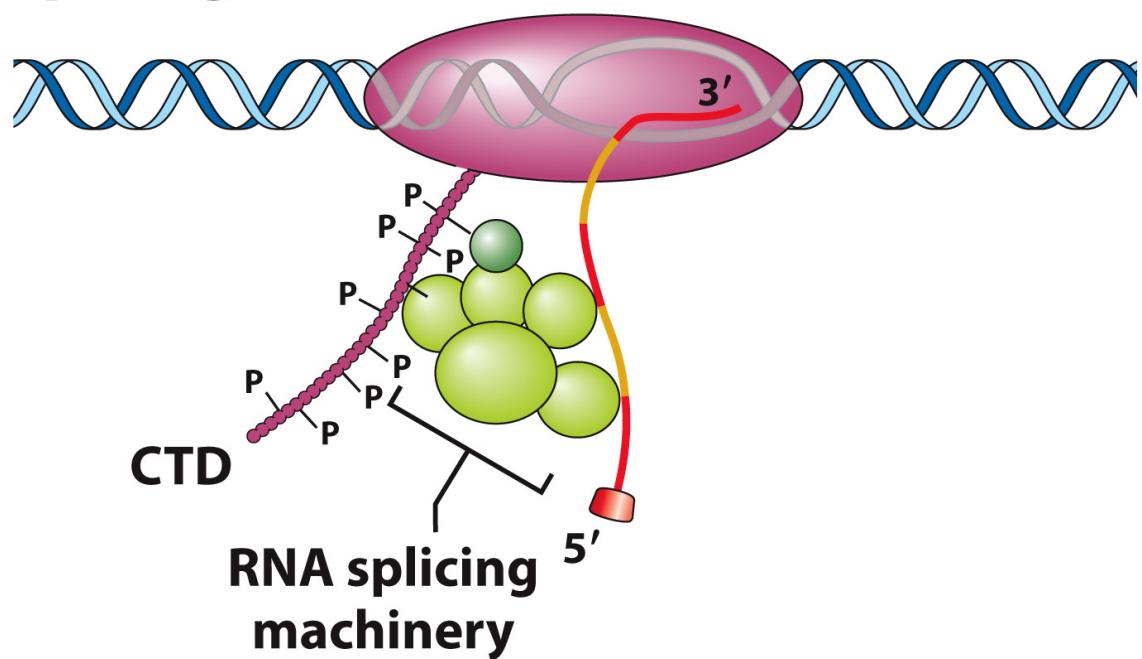


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Cotranscriptional processing of RNA

Cleavage and polyadenylation

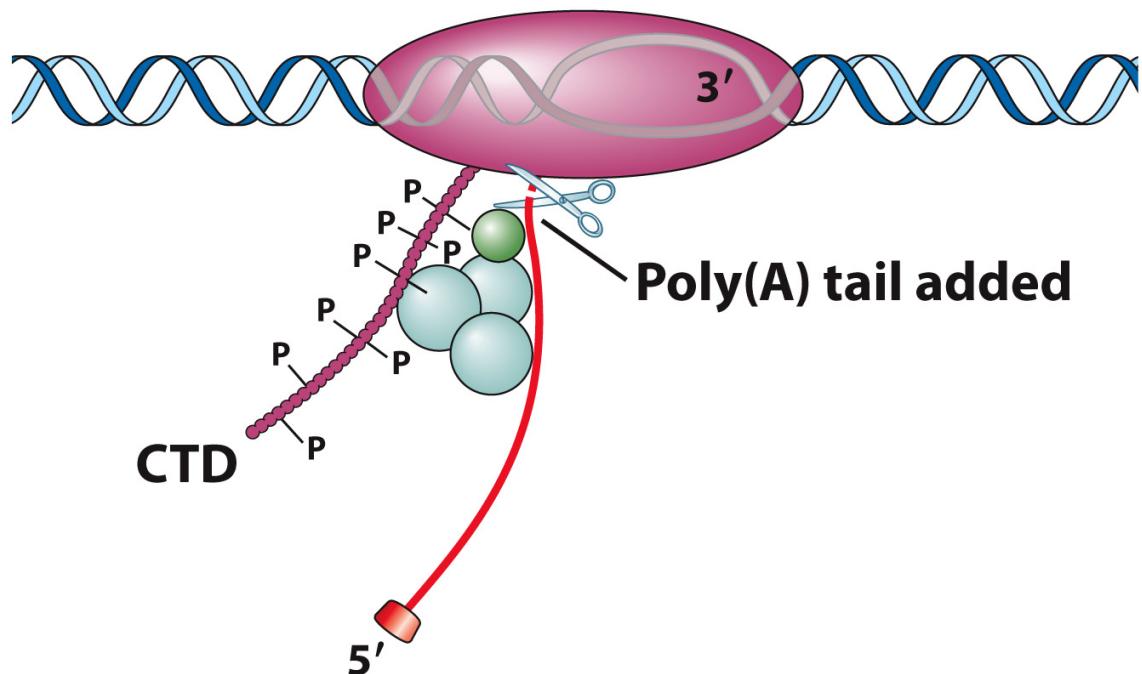


Figure 8-13c
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Cotranscriptional processing of RNA

Final product



Figure 8-13d
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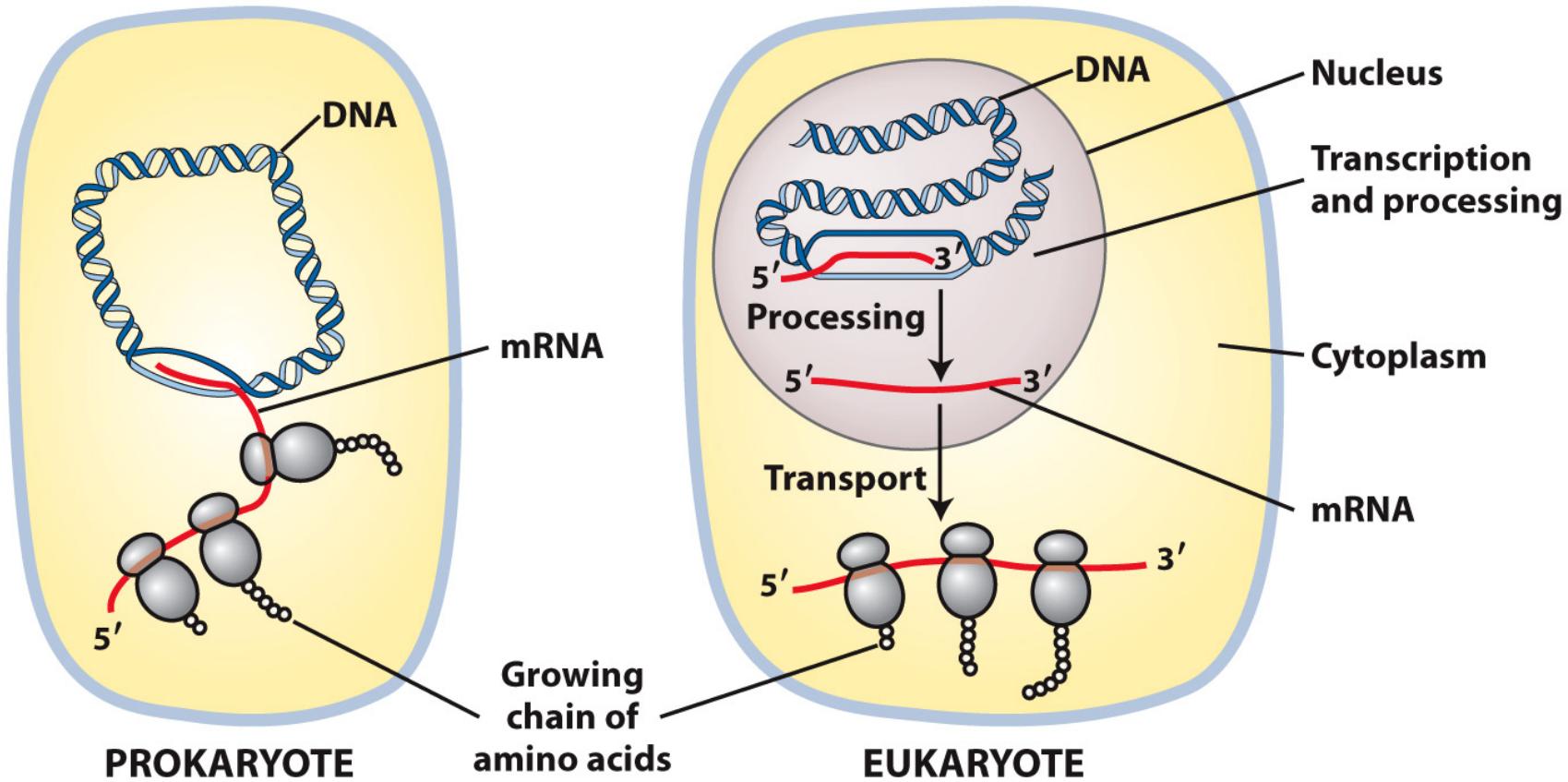


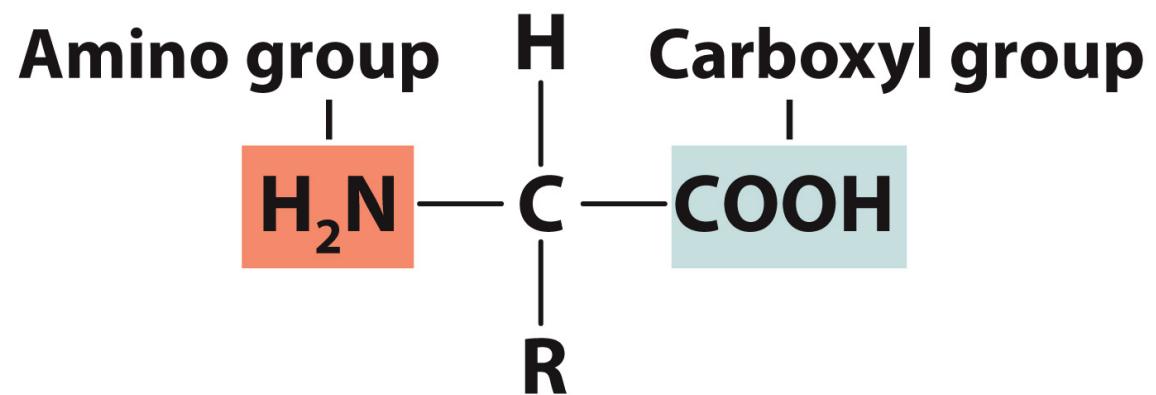
Figure 8-11

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Chapter 9: Proteins and the Genetic Code

Amino acid structure



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The peptide bond

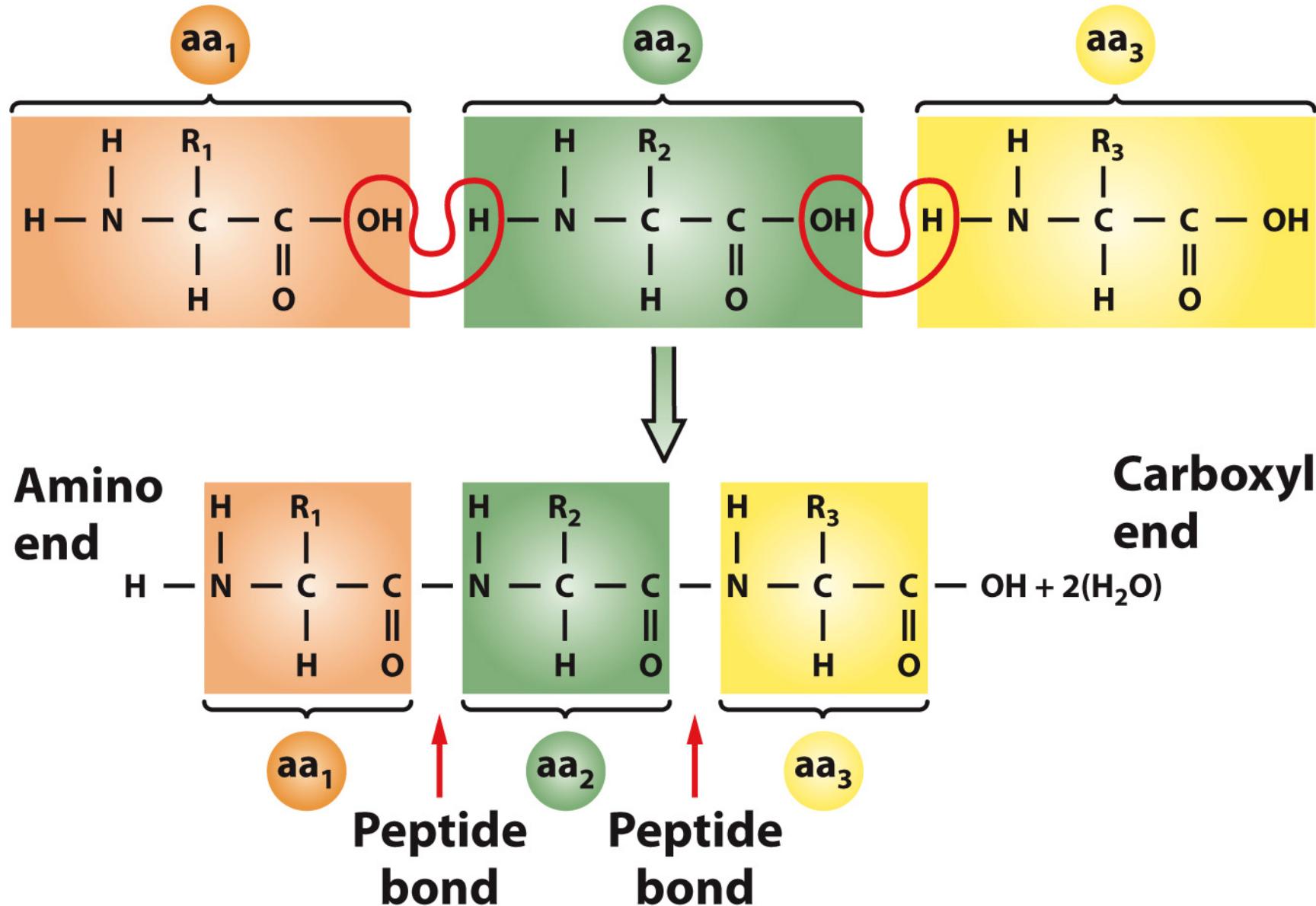


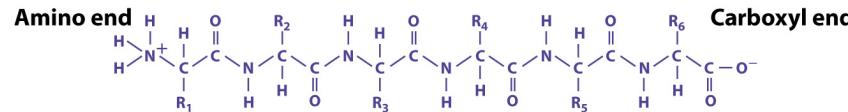
Figure 9-2a

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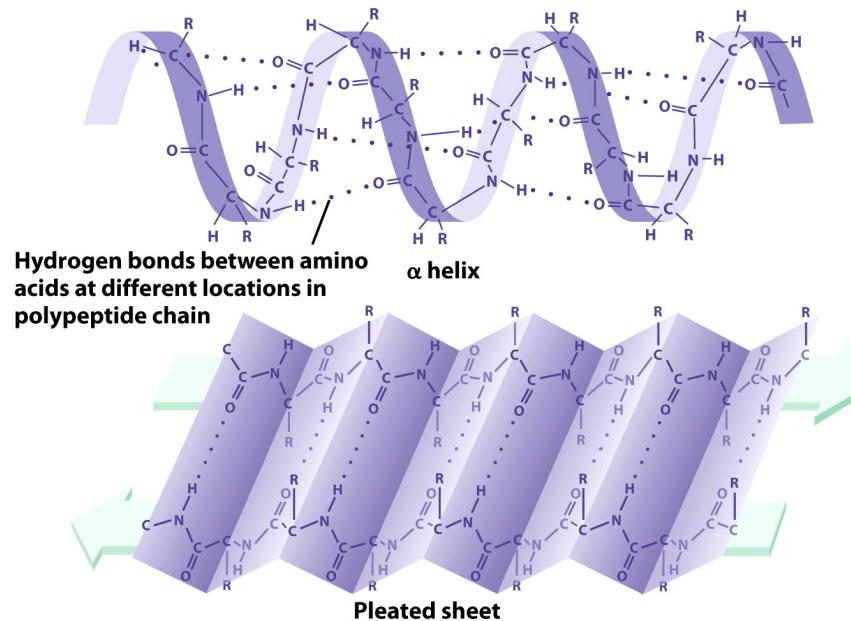
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Levels of protein structure

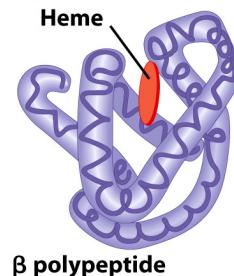
(a) Primary structure



(b) Secondary structure



(c) Tertiary structure



(d) Quaternary structure

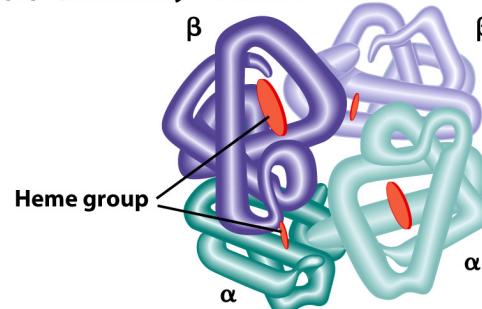


Figure 9-3

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Overlapping versus nonoverlapping genetic codes

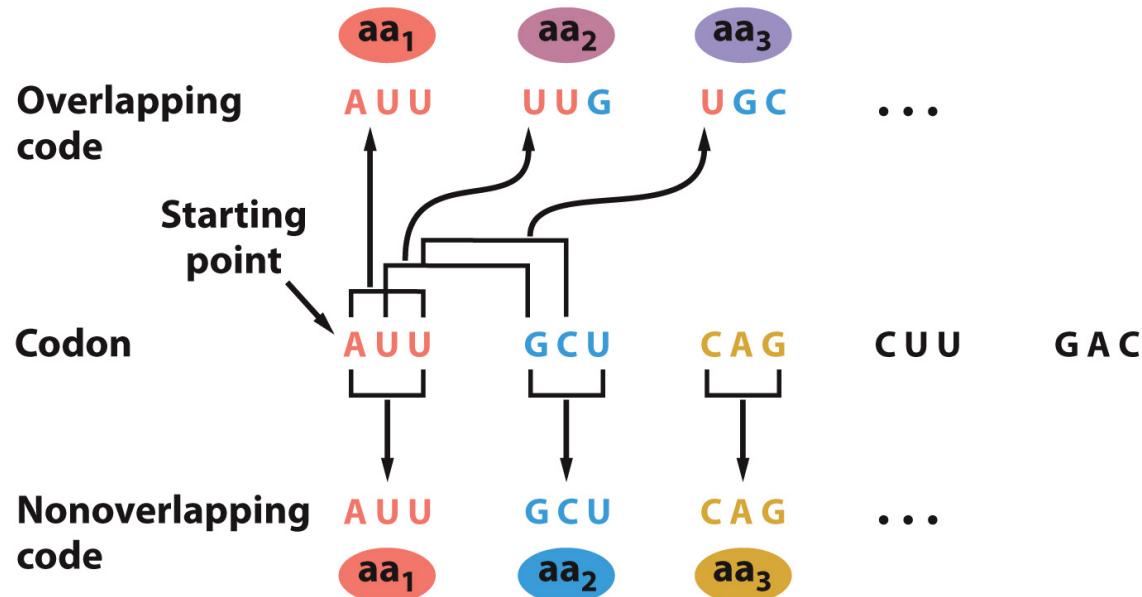
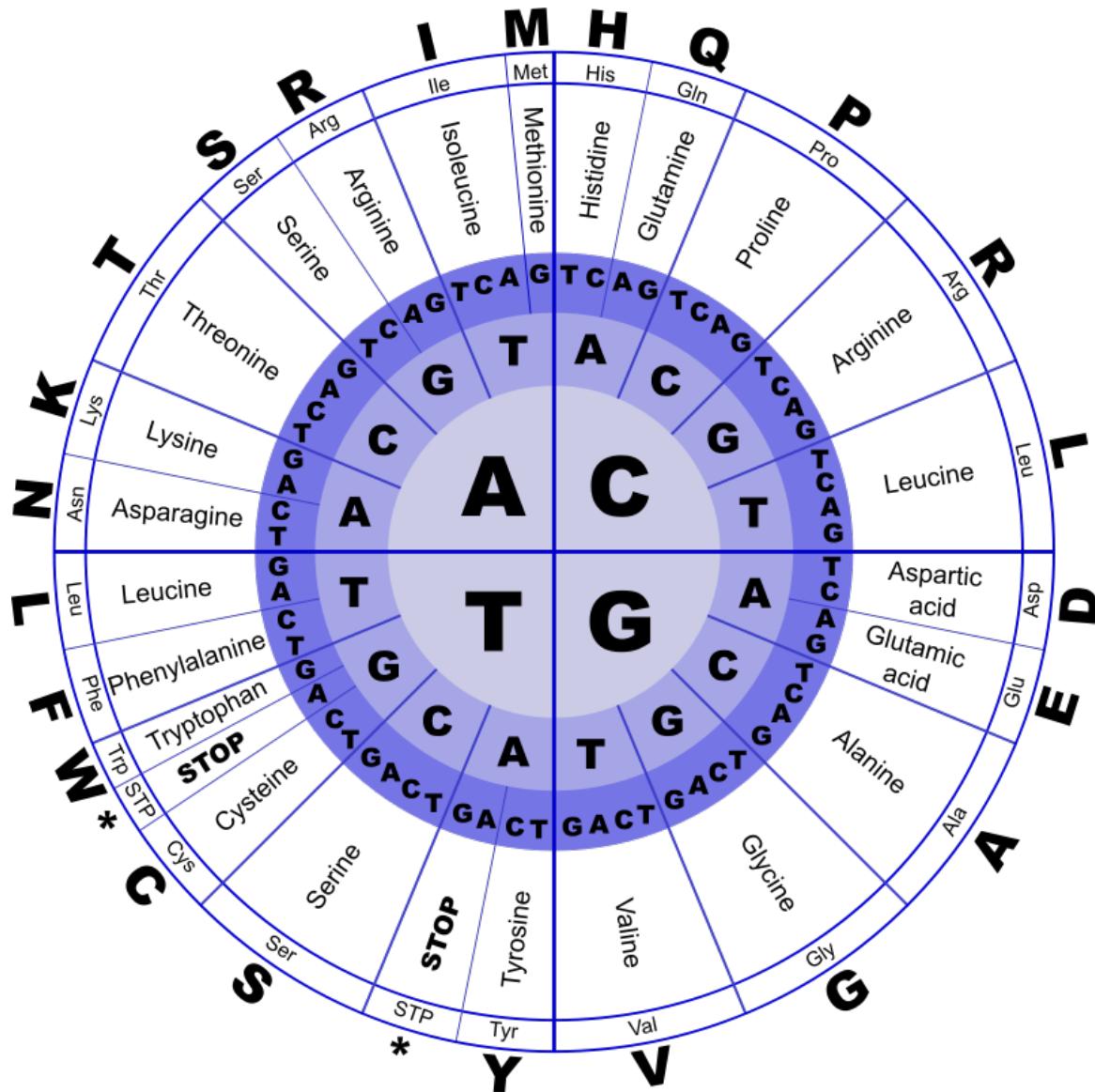


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The genetic code



The structure of tRNA

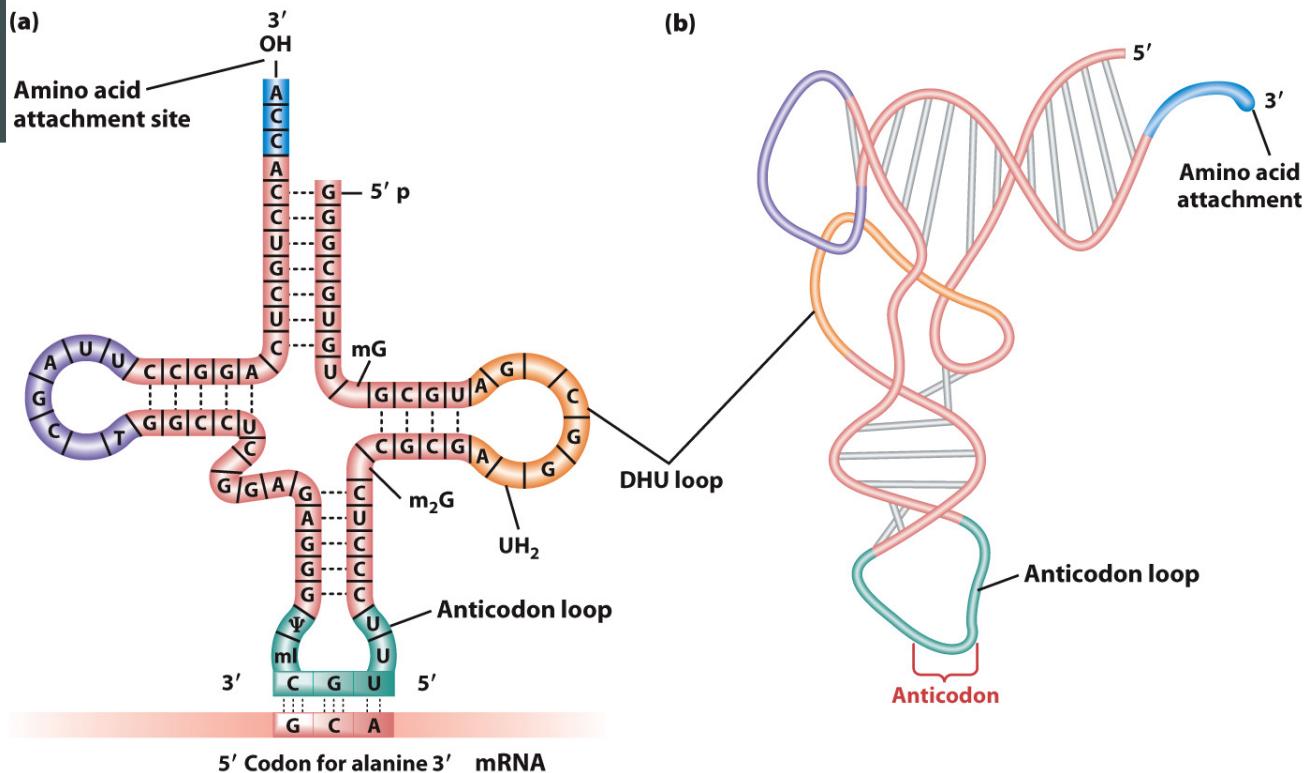
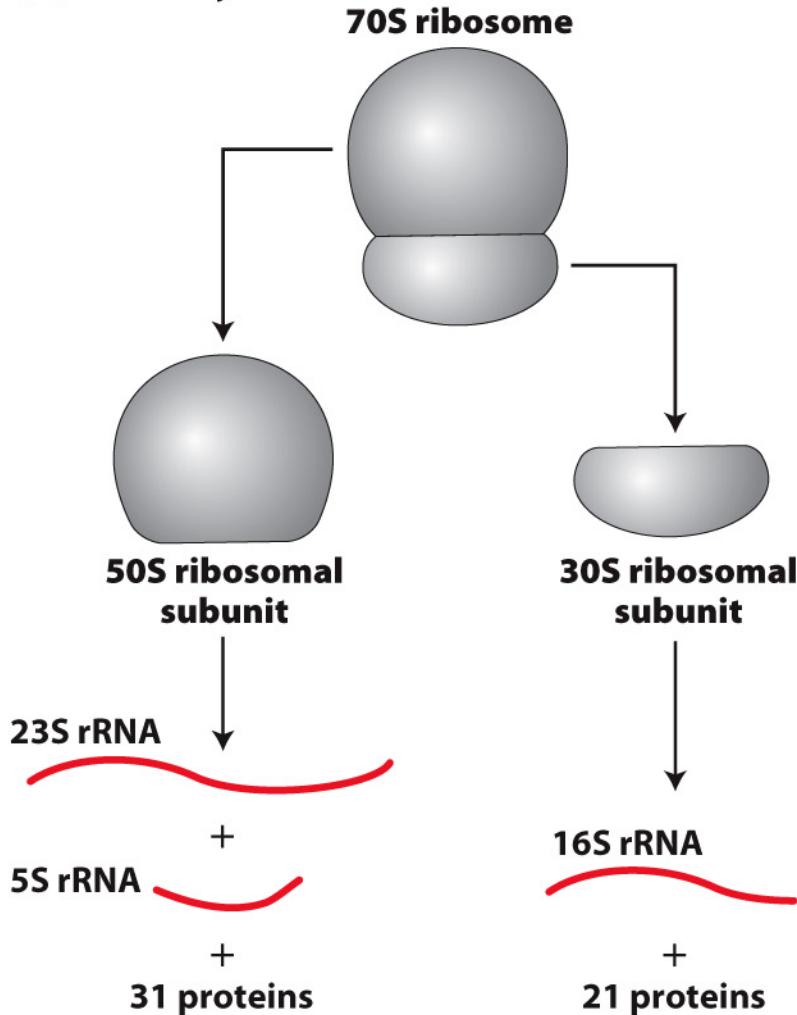


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Two subunits of ribosomes are composed of rRNA and many proteins

(a) Prokaryotic



(b) Eukaryotic

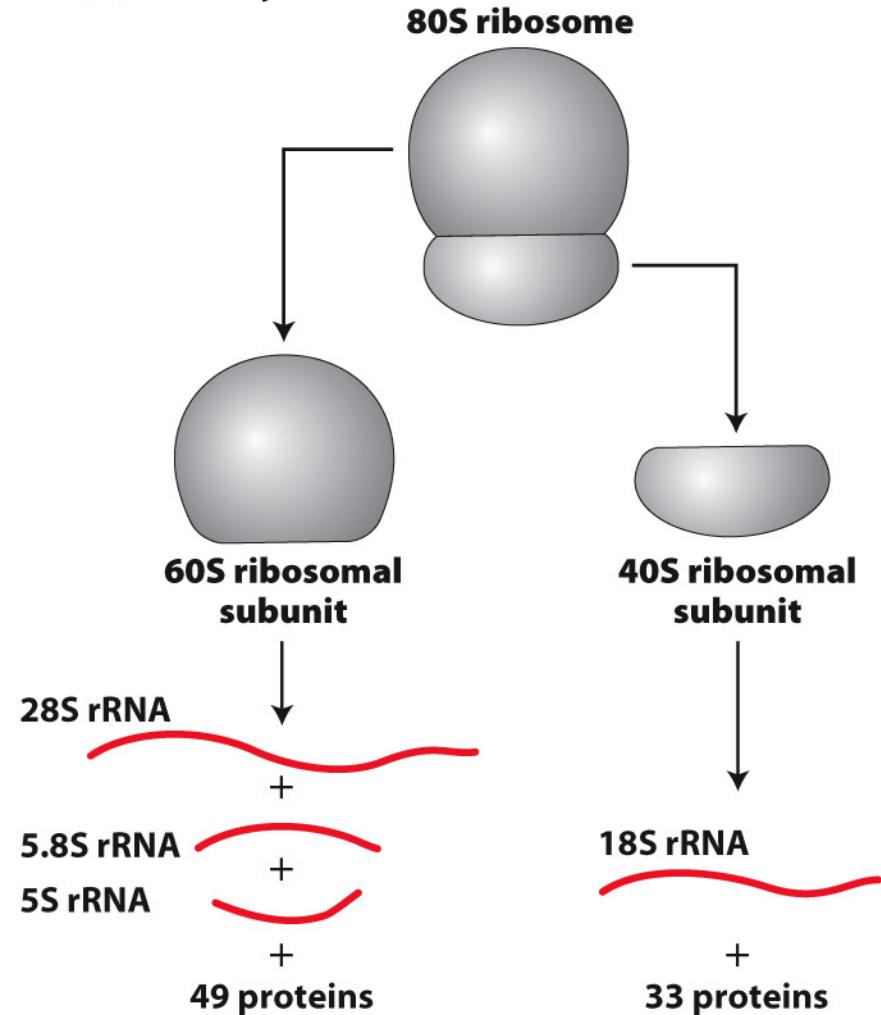


Figure 9-10

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Schematic model

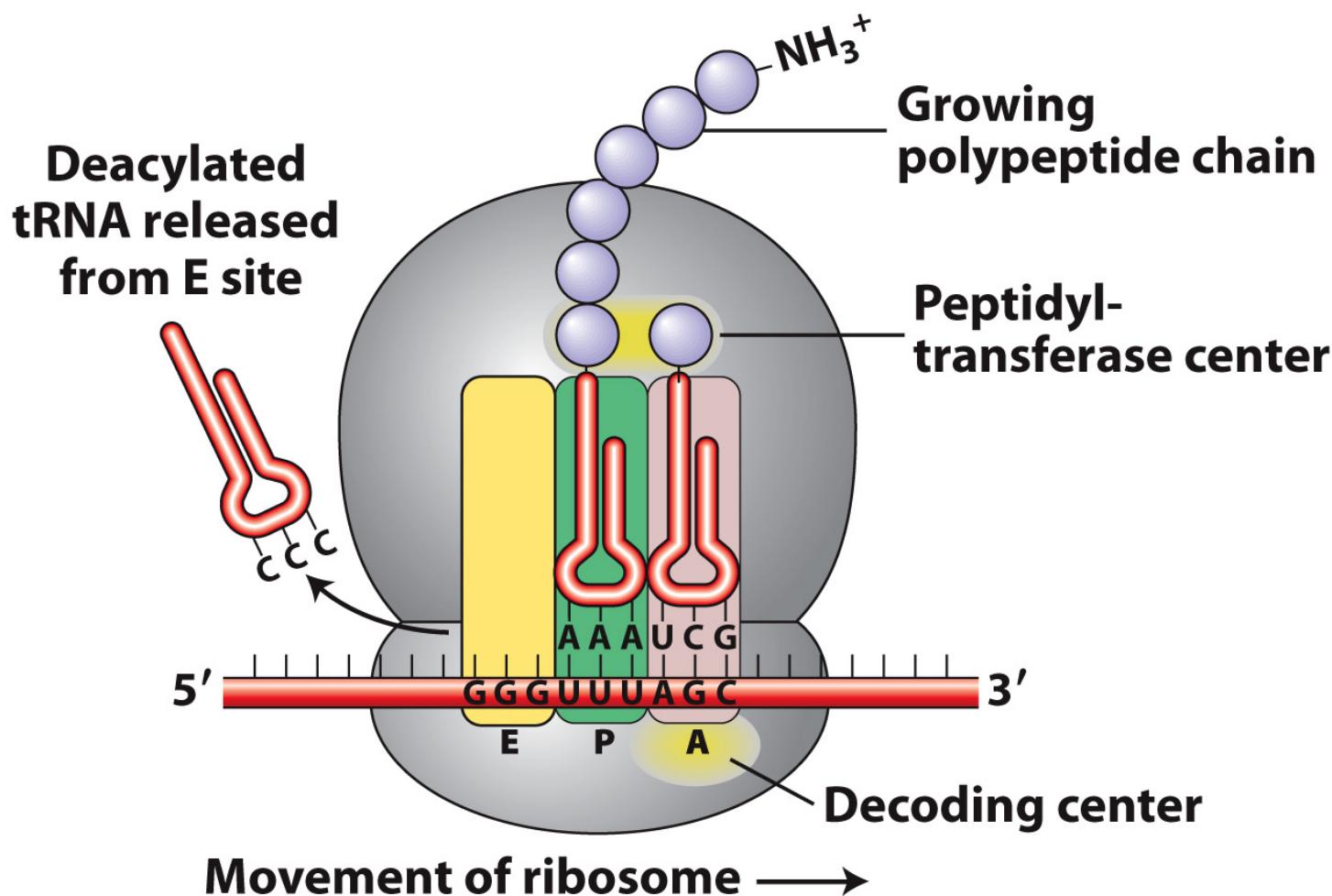


Figure 9-12b

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Translation initiation in prokaryotes

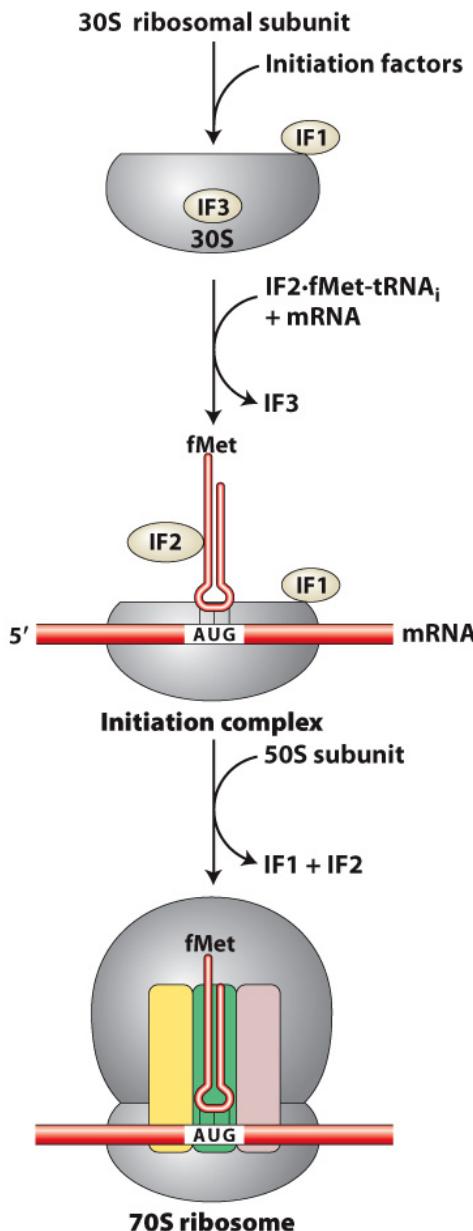


Figure 9-14

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30S

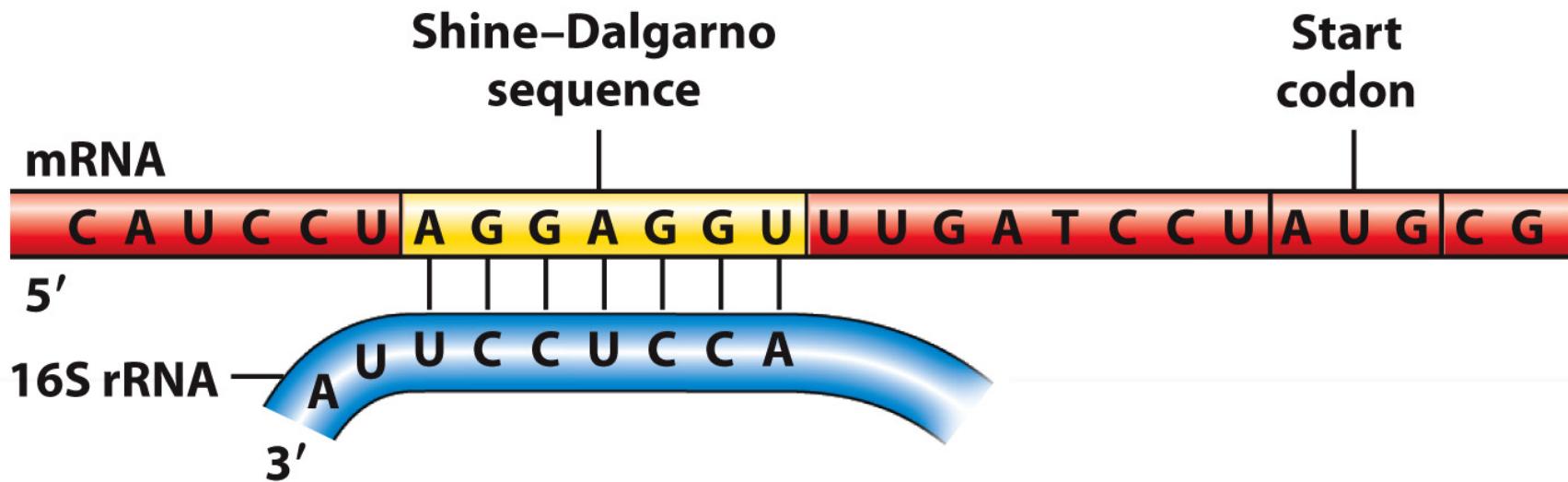


Figure 9-13

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Translation initiation in eukaryotes

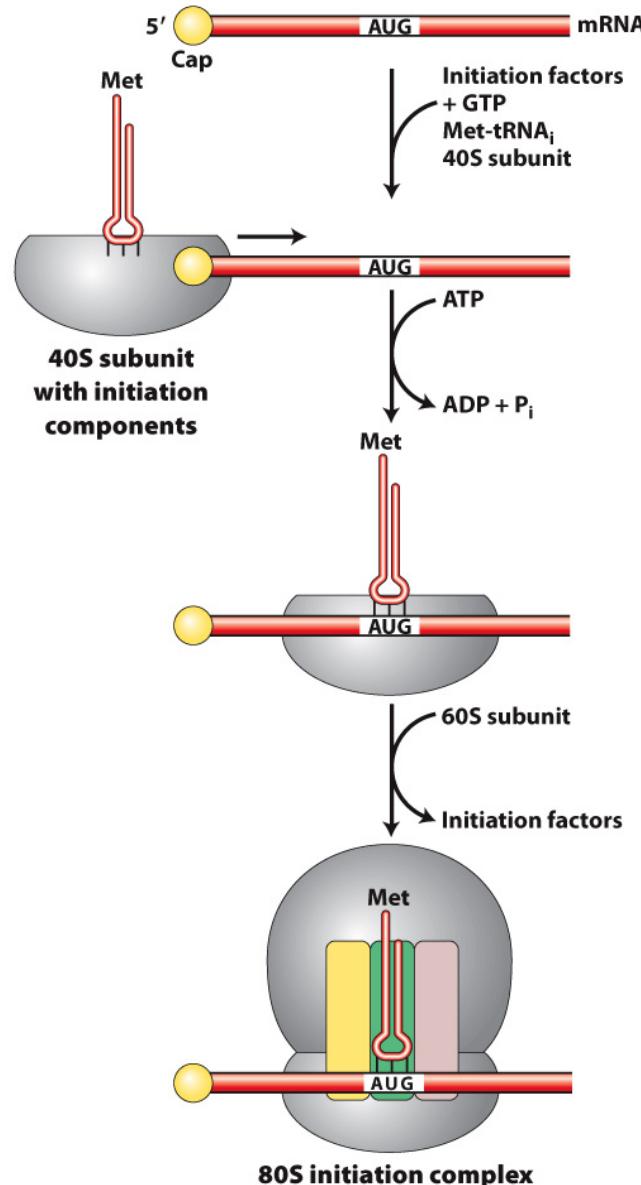


Figure 9-15

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Steps in translation elongation

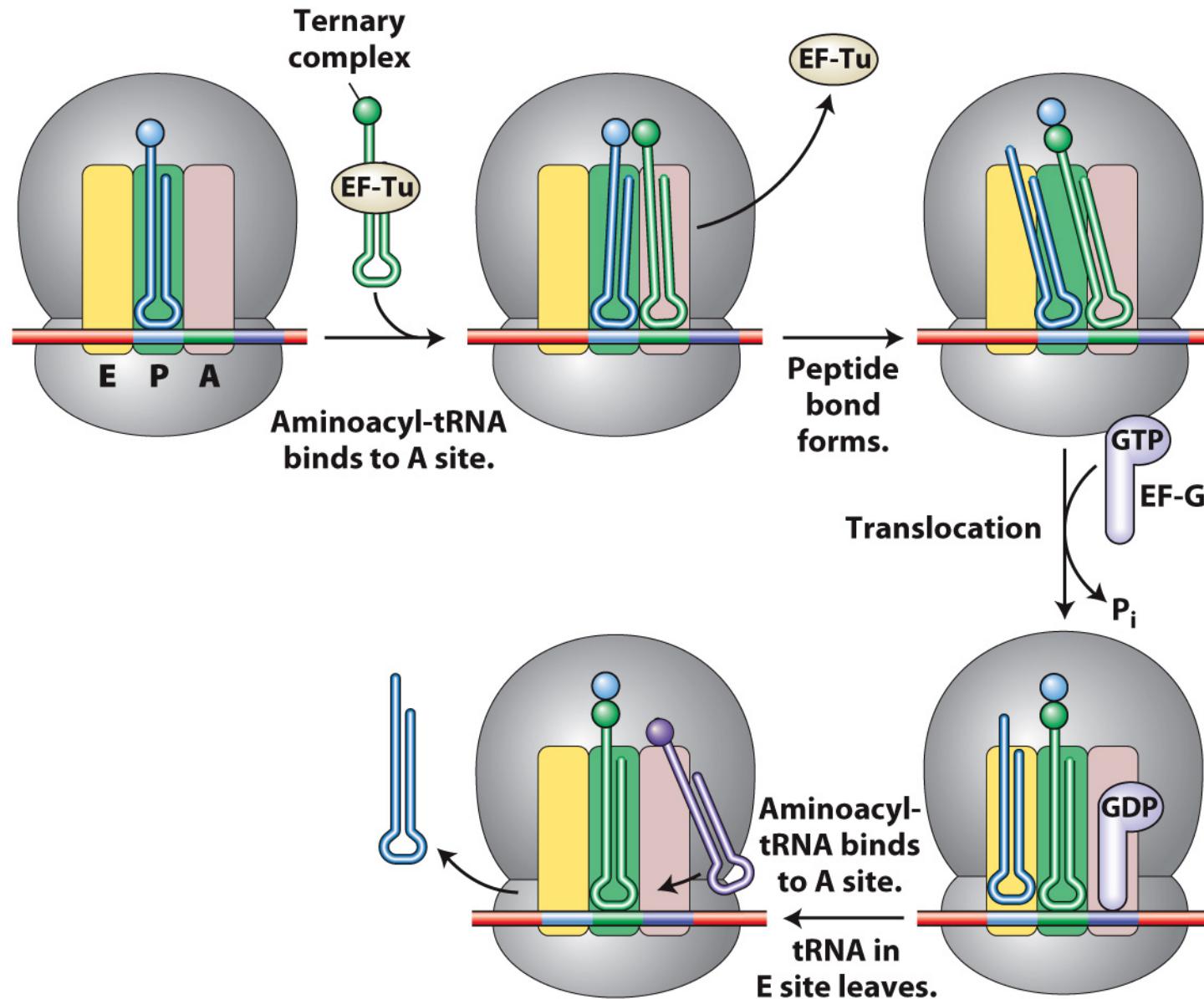


Figure 9-16

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Termination of translation

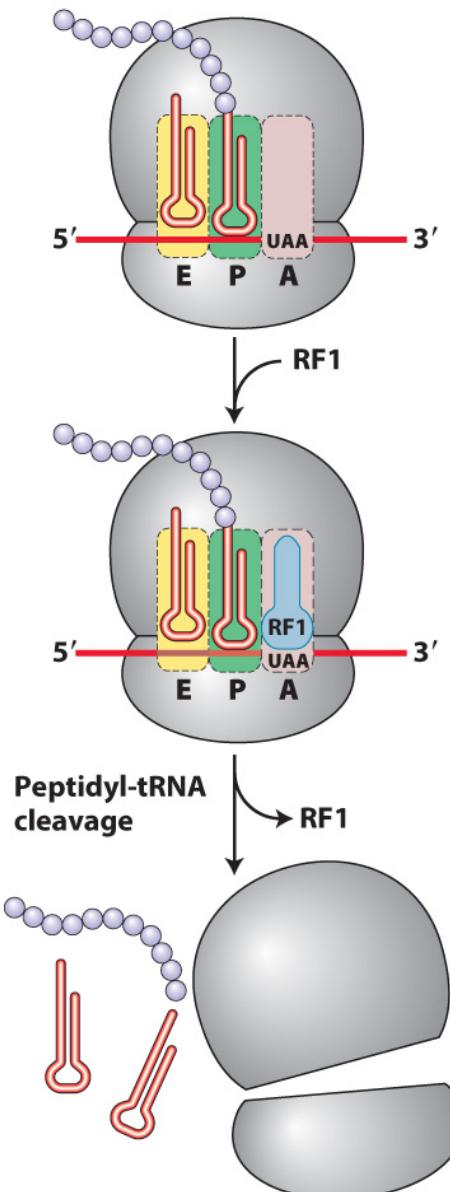
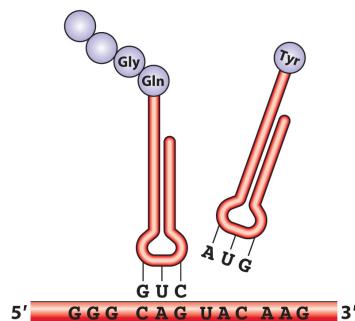


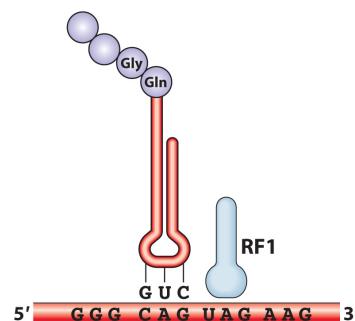
Figure 9-17
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Nonsense suppressor mutation

(a) Wild type: no mutations. The tyrosine tRNA binds to the codon UAC.



(b) Amber mutation introduces UAG stop codon. Translation stops.



(c) A further mutation changes the tyrosine tRNA codon to AUC. Tyrosine tRNA reads the UAG codon. Translation continues.

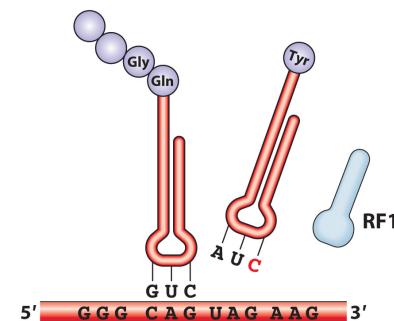


Figure 9-18
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GOOD LUCK !

YOU ROCK !