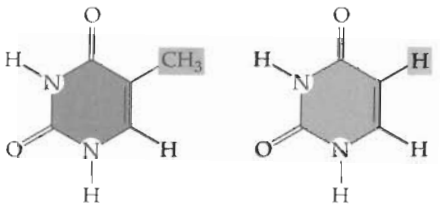
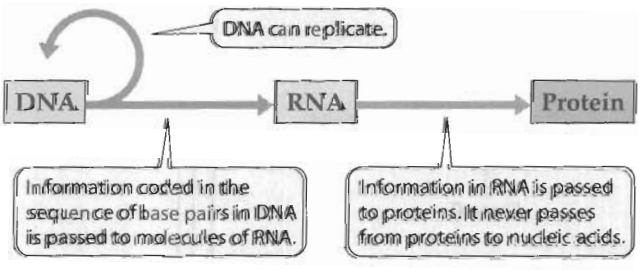
12 From DNA to Protein: Genotype to Phenotype

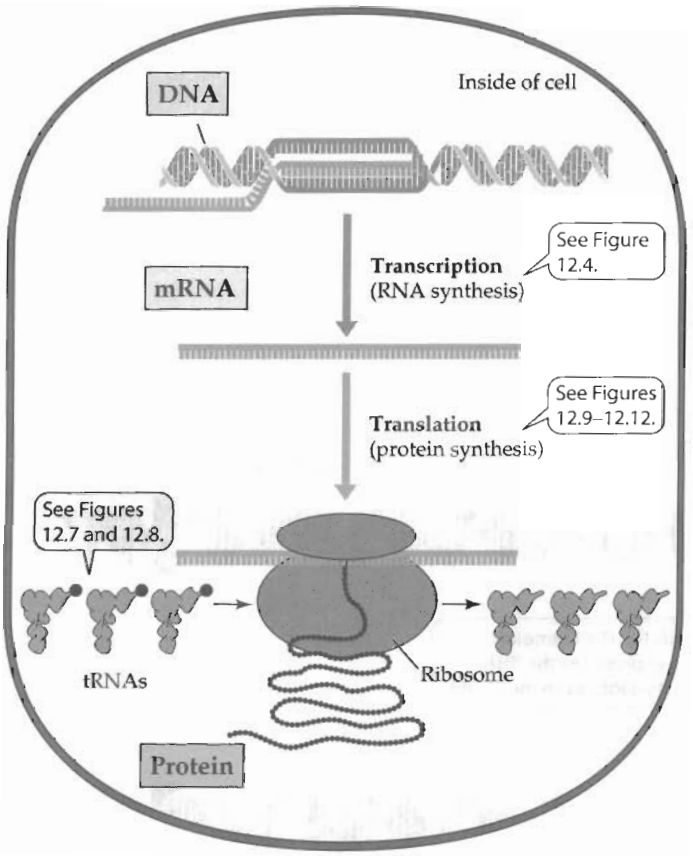


Thymine Uracil

In-Text Art *(Page 236)*



12.2: The Central Dogma *(Page 236)*



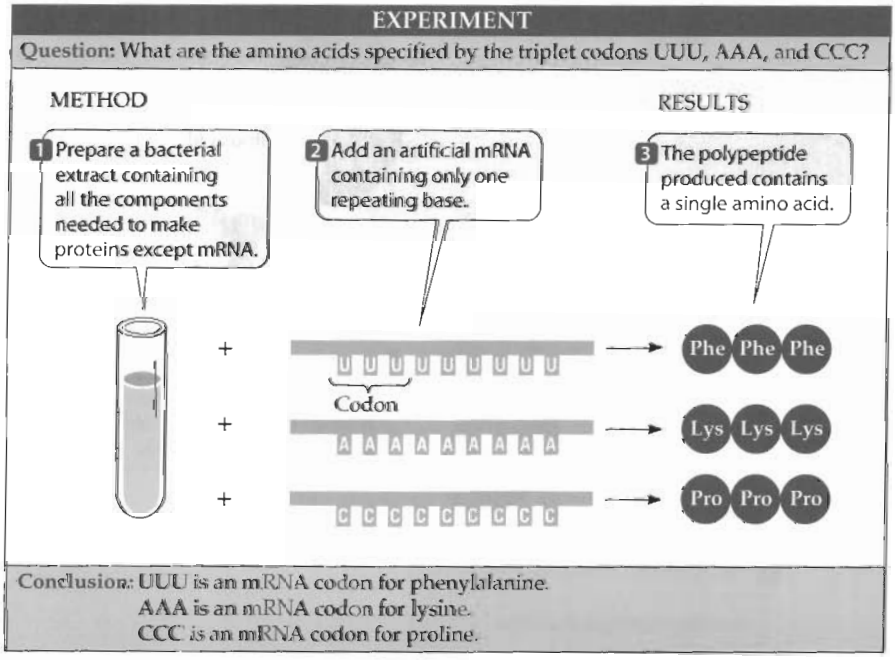
12.3 From Gene to Protein *(Page 237)*

In-Text Art *(Page 237)*

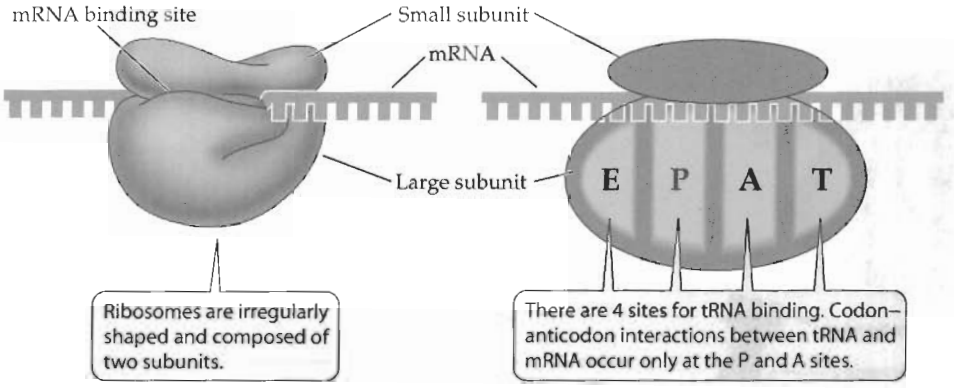
In-Text Art *(Page 237)*

First letter	Second letter: U	Second letter: C	Second letter: A	Second letter: G	Third letter
U	UUU, UUC: Phenylalanine	UCU, UCC, UCA, UCG: Serine	UAU, UAC: Tyrosine	UGU, UGC: Cysteine	U C A G
	UUA, UUG: Leucine		UAA: Stop codon; UAG: Stop codon	UGA: Stop codon; UGG: Tryptophan	
C	CUU, CUC, CUA, CUG: Leucine	CCU, CCC, CCA, CCG: Proline	CAU, CAC: Histidine	CGU, CGC, CGA, CGG: Arginine	U C A G
			CAA, CAG: Glutamine		
A	AUU, AUC, AUA: Isoleucine	ACU, ACC, ACA, ACG: Threonine	AAU, AAC: Asparagine	AGU, AGC: Serine	U C A G
	AUG: Methionine; start codon		AAA, AAG: Lysine	AGA, AGG: Arginine	
G	GUU, GUC, GUA, GUG: Valine	GCU, GCC, GCA, GCG: Alanine	GAU, GAC: Aspartic acid	GGU, GGC, GGA, GGG: Glycine	U C A G
			GAA, GAG: Glutamic acid		

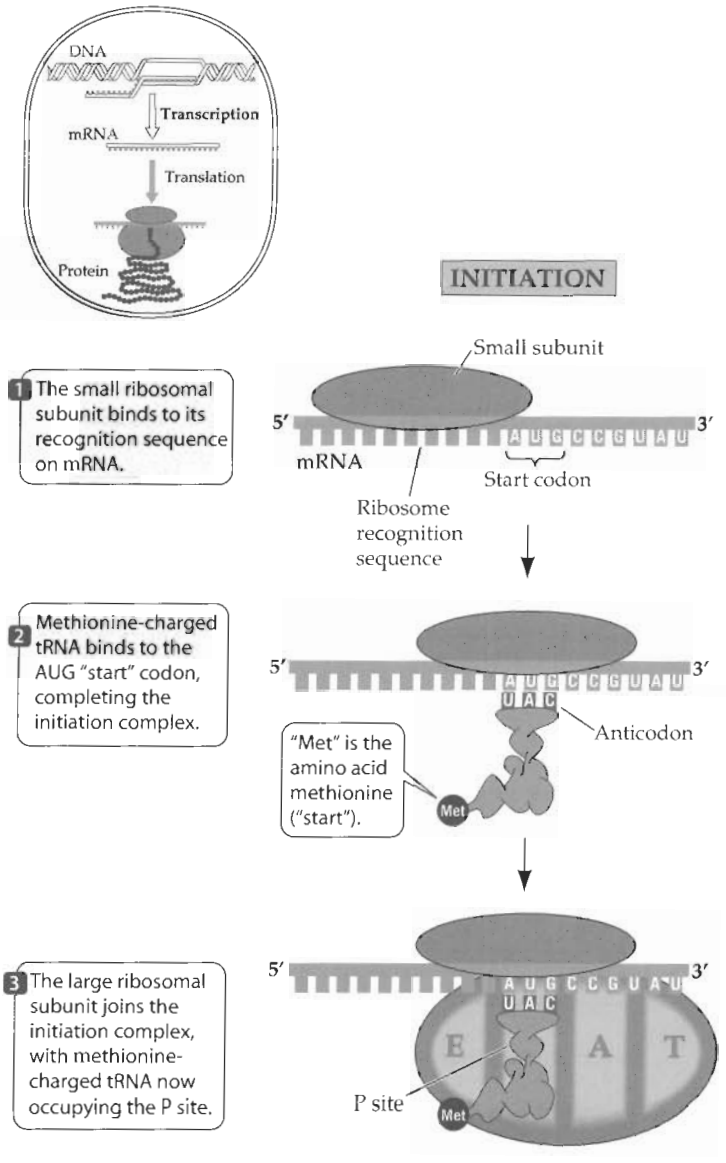
12.5 The Universal Genetic Code *(Page 239)*



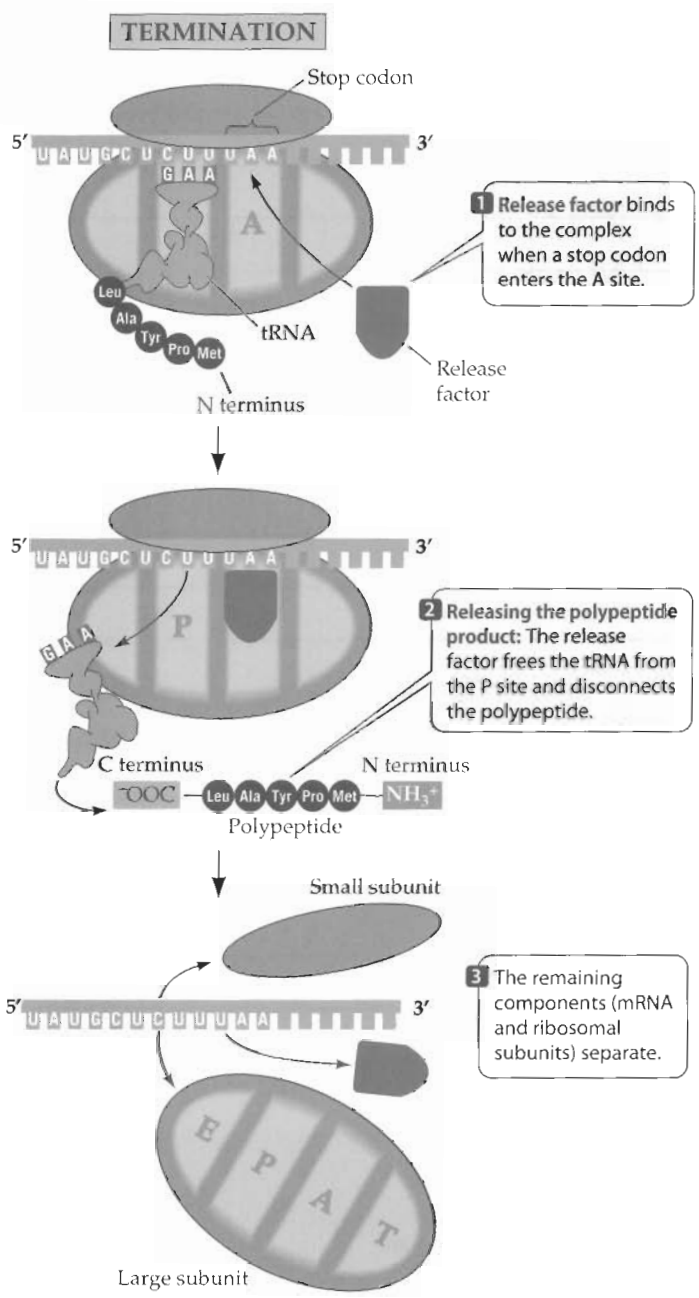
12.6 Deciphering the Genetic Code *(Page 240)*



12.9 Ribosome Structure *(Page 243)*



12.10 The Initiation of Translation *(Page 244)*



12.12 **The Termination of Translation** *(Page 246)*

12.1 Signals that Start and Stop Transcription and Translation

	TRANSCRIPTION	TRANSLATION
Initiation	Promoter sequence in DNA	AUG start codon in mRNA
Termination	Terminator sequence in DNA	UAA, UAG, or UGA stop codon in mRNA

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12.2 Antibiotics that Inhibit Bacterial Protein Synthesis

ANTIBIOTIC	STEP INHIBITED
Chloromycetin	Formation of peptide bonds
Erythromycin	Translocation of mRNA along ribosome
Neomycin	Interactions between tRNA and mRNA
Streptomycin	Initiation of translation
Tetracycline	Binding of tRNA to ribosome
Paromomycin	Validation of mRNA–tRNA match

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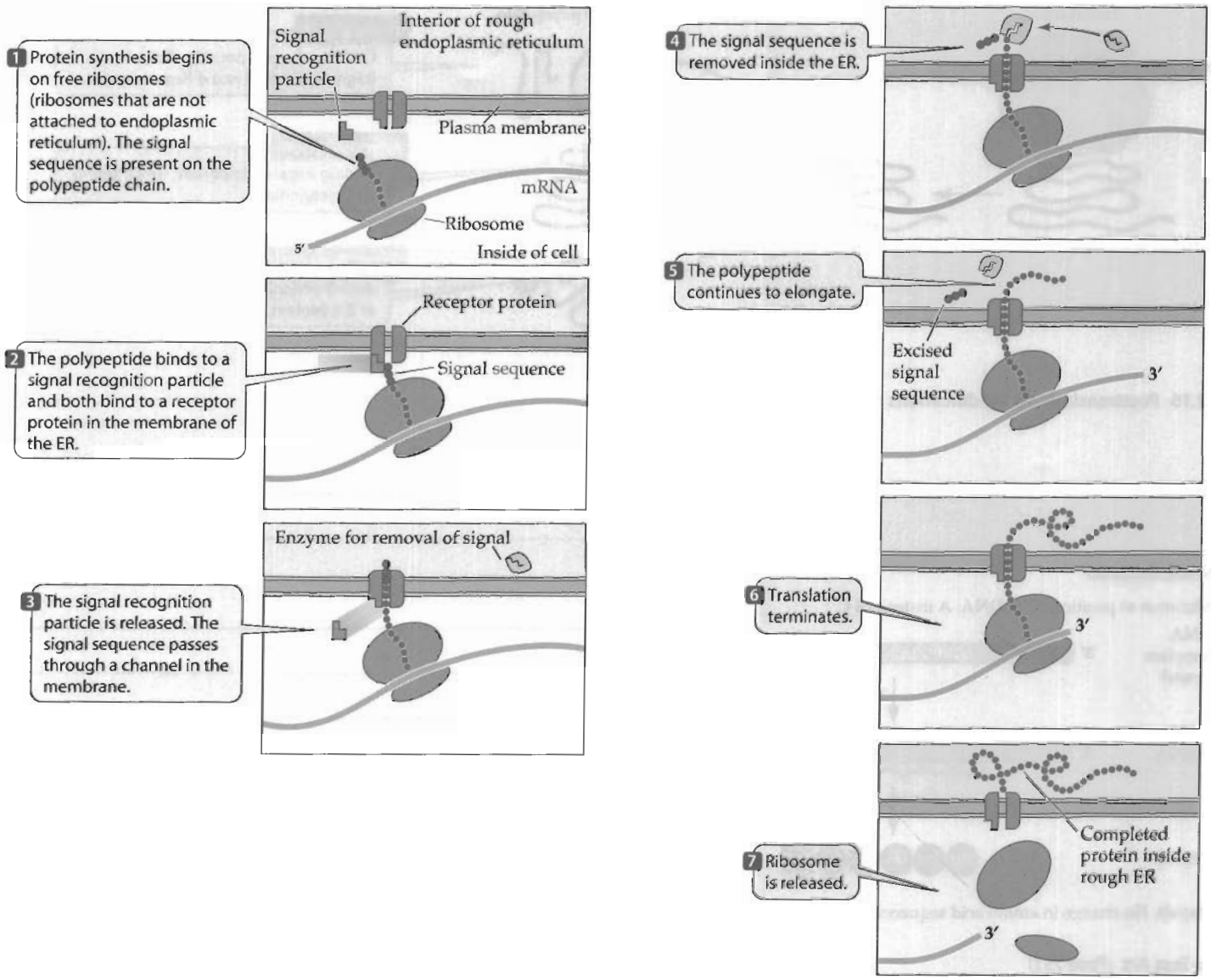
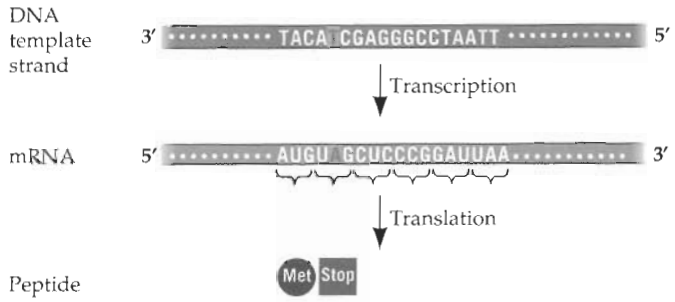


12.15 A Signal Sequence Moves a Polypeptide into the ER *(Page 249)*

Nonsense mutation

Mutation at position 5 in DNA: T instead of C

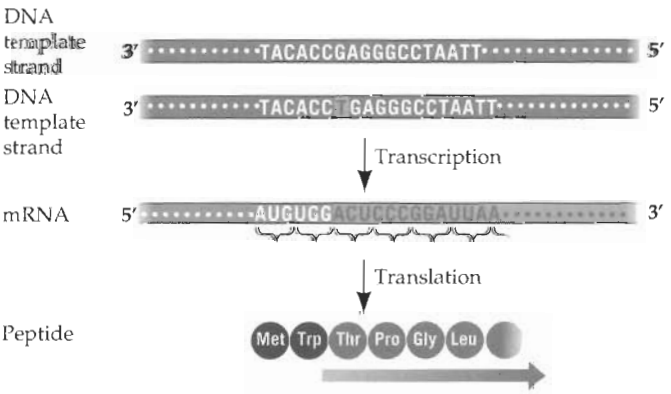


Result: Only one amino acid translated; no protein made

In-Text Art *(Page 252)*

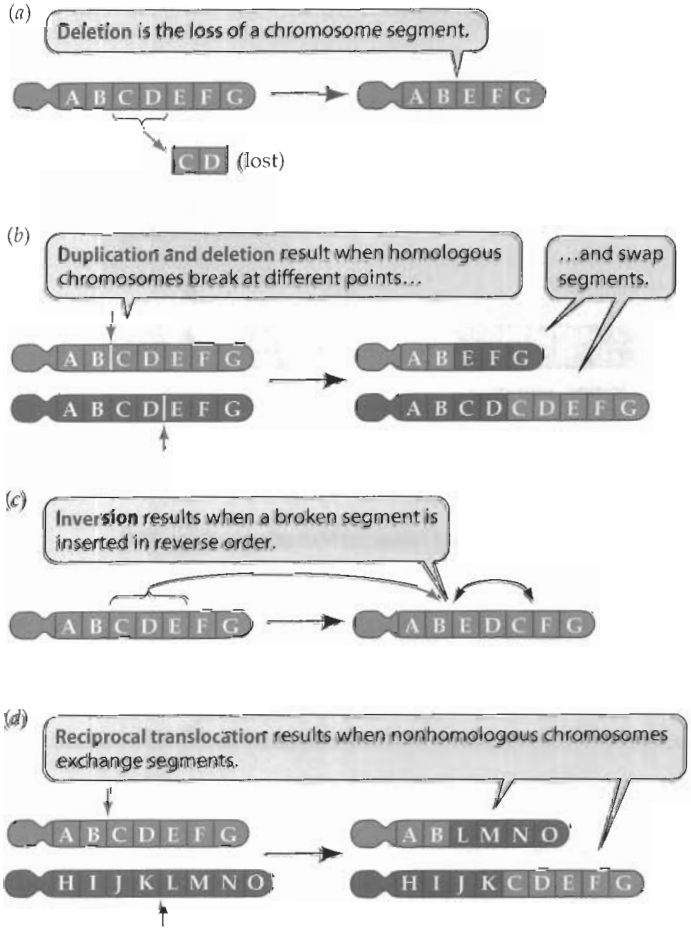
Frame-shift mutation

Mutation by insertion of T between bases 6 and 7 in DNA



Result: All amino acids changed beyond the insertion

In-Text Art *(Page 252)*



12.18 Chromosomal Mutations *(Page 253)*