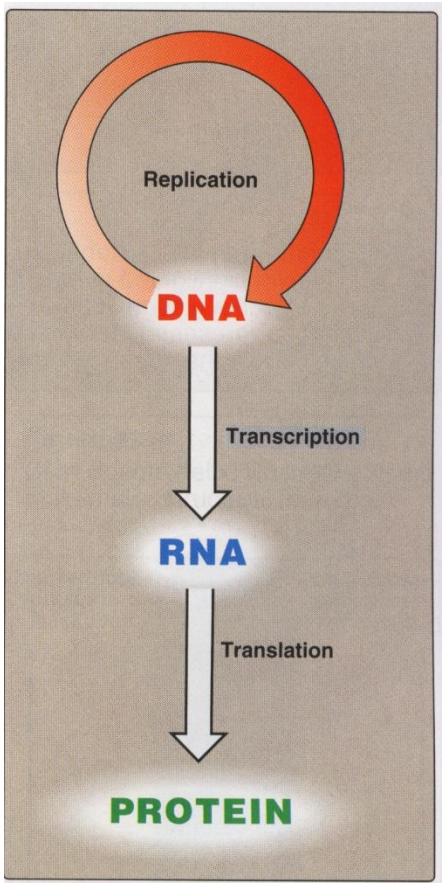
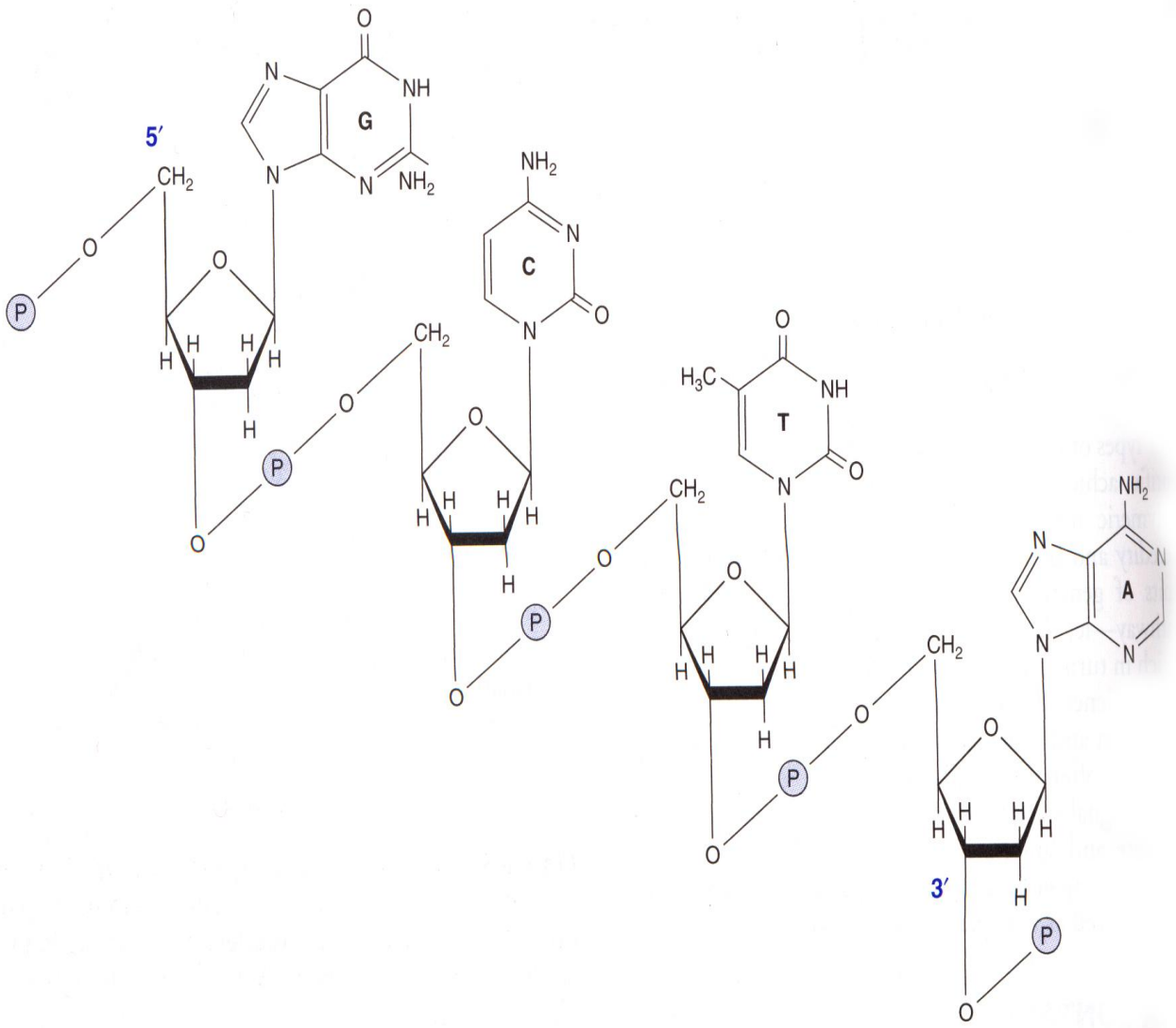
Nucleic Acid Structure & Function


Replication
DNA
Transcription
RNA
Translation
PROTEIN


5′
3′
G
C
T
A
P
O
N
NH
NH2
CH2
H3C
H

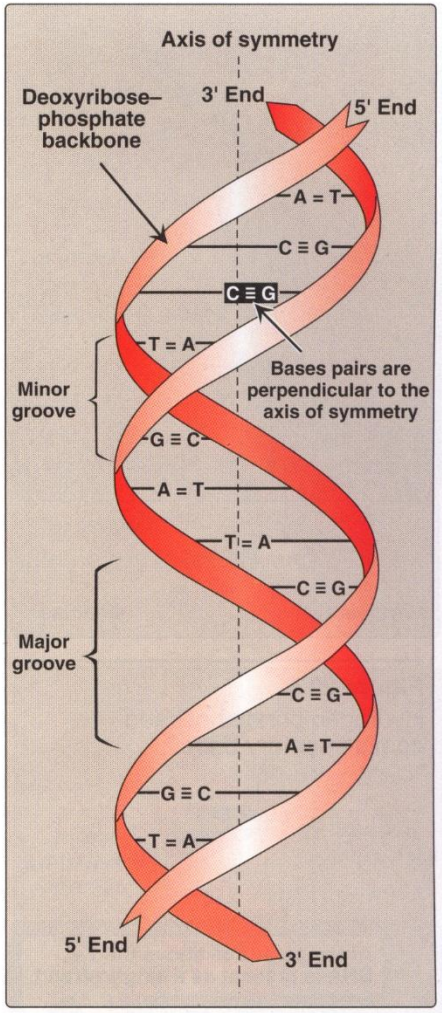
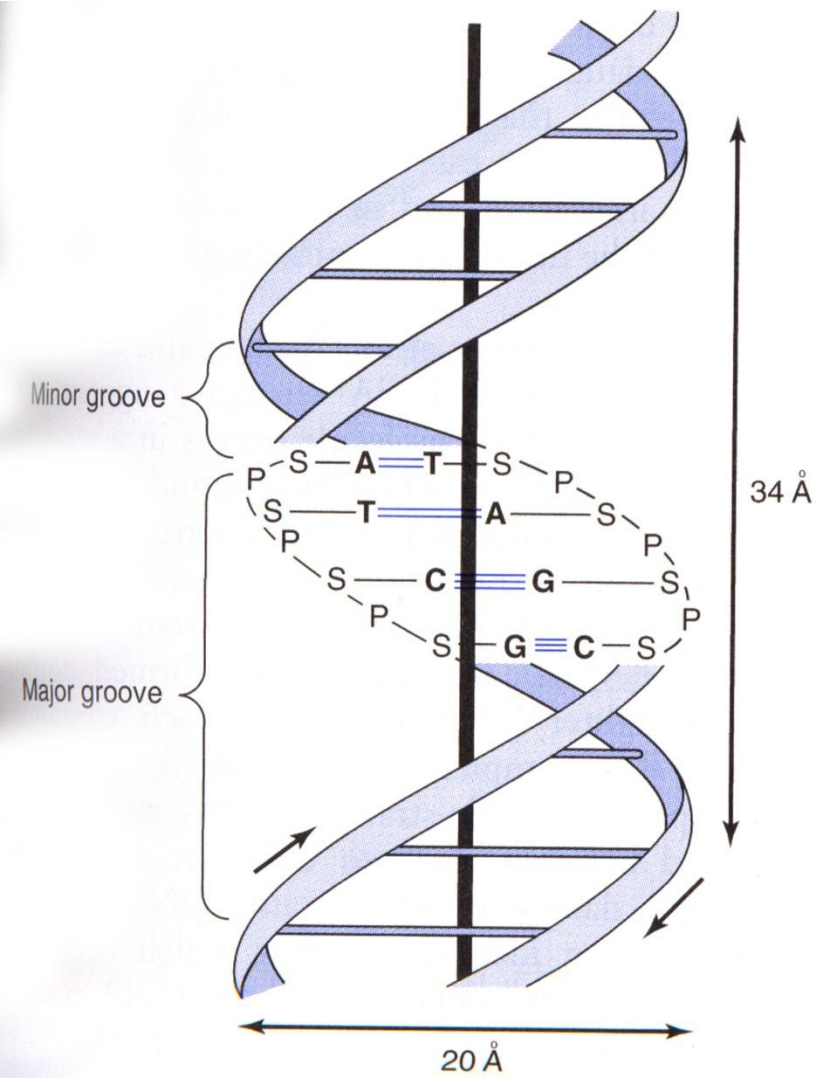
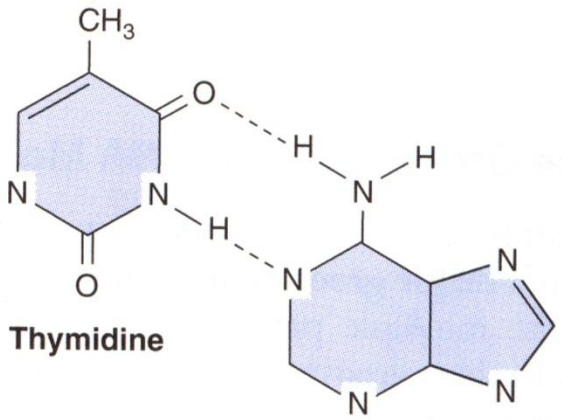
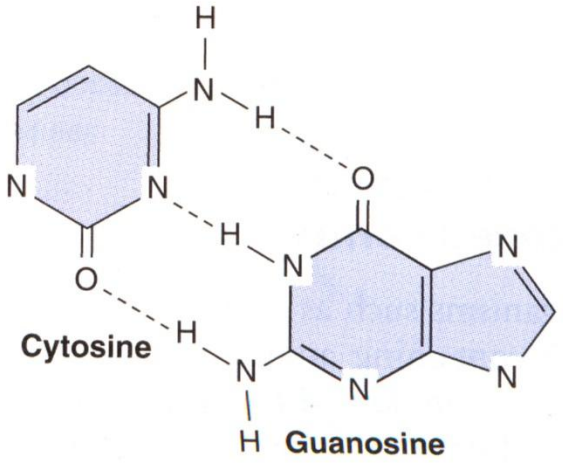

Axis of symmetry
Deoxyribose–phosphate backbone
3' End
5' End
A = T
C ≡ G
C ≡ G
T = A
Bases pairs are perpendicular to the axis of symmetry
Minor groove
G ≡ C
A = T
T = A
C ≡ G
Major groove
C ≡ G
A = T
G ≡ C
T = A
5' End
3' End

Figure 29.3


Minor groove
Major groove
34 Å
20 Å
A
T
C
G


CH3
Thymidine
Adenosine


Cytosine
Guanosine

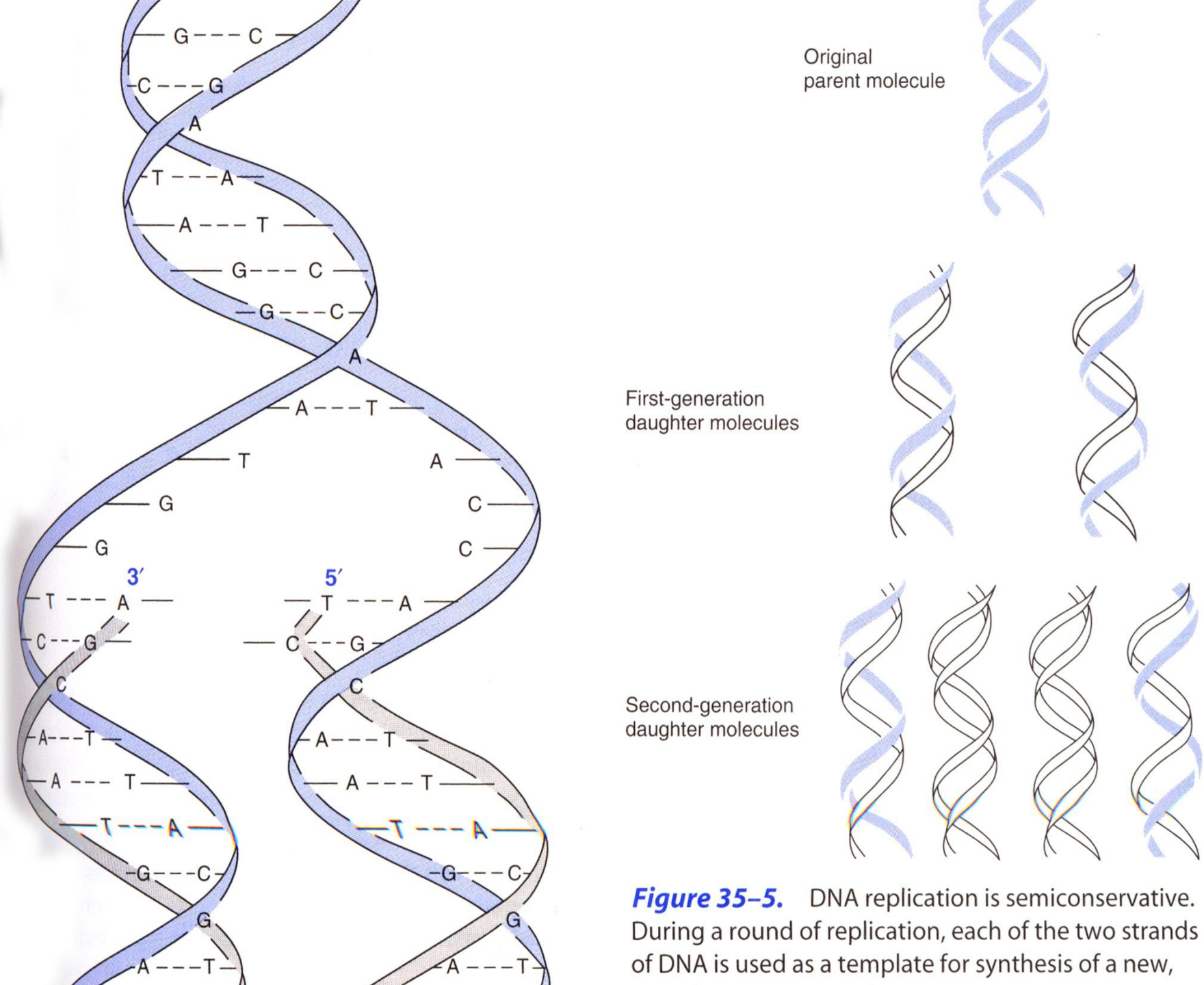
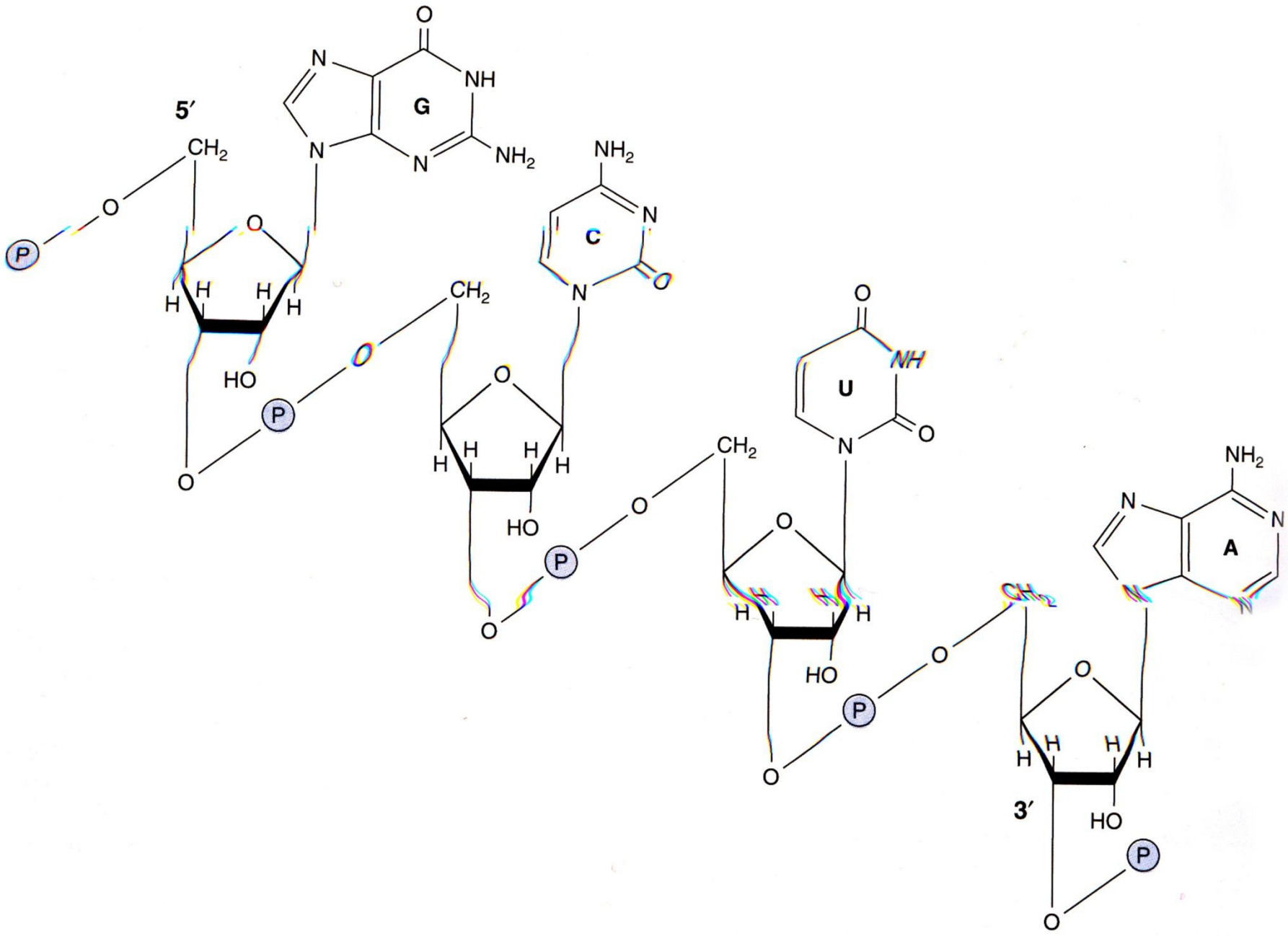


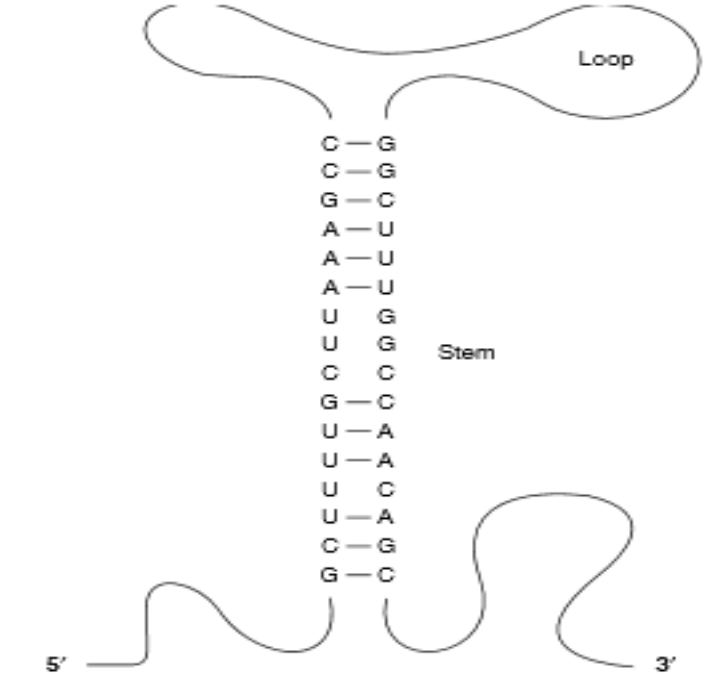
Figure 35–5. DNA replication is semiconservative. During a round of replication, each of the two strands of DNA is used as a template for synthesis of a new,

The Chemical Nature of RNA Differs from that of DNA

- The Sugar (Ribose vs DeoxyRibose)
- The bases(U vs T)
- Single stranded vs Double stranded
- A not equal to U and C not equal to G
- Stability

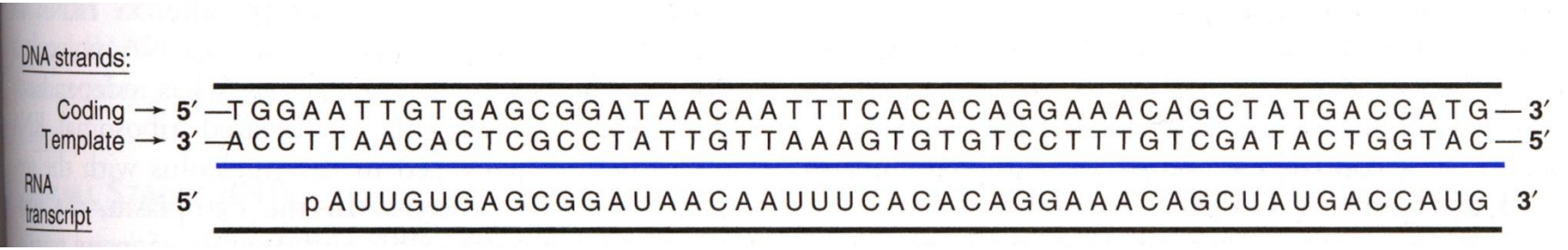

5′
3′
G
C
U
A
P
HO
NH2
CH2

Hairpin structure

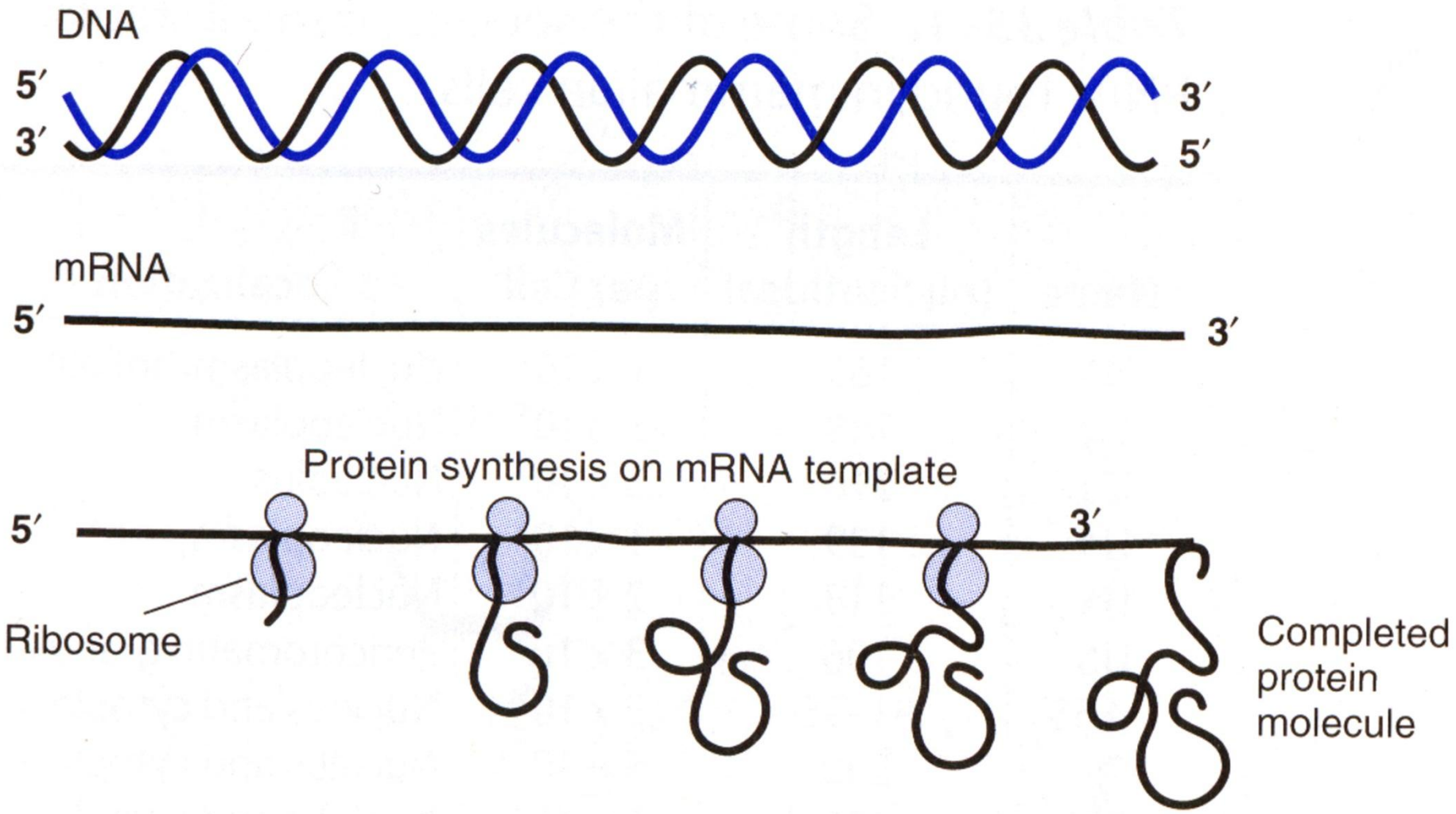


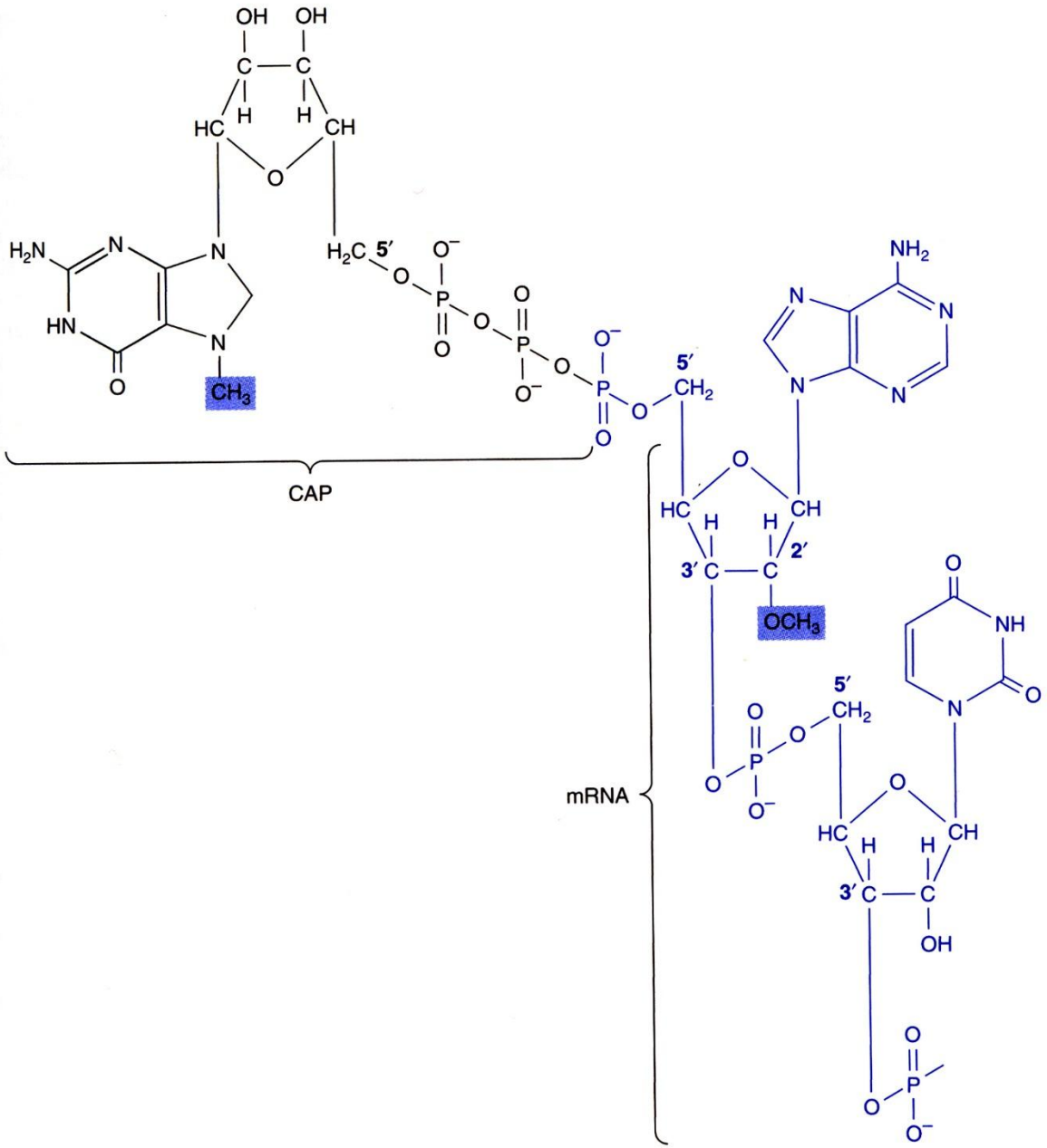
Diagrammatic representation of the secondary structure of a single-stranded RNA molecul in which a stem loop, or "hairpin," has been formed ar is dependent upon the intramolecular base pairing. Note that A forms hydrogen bonds with U in RNA.

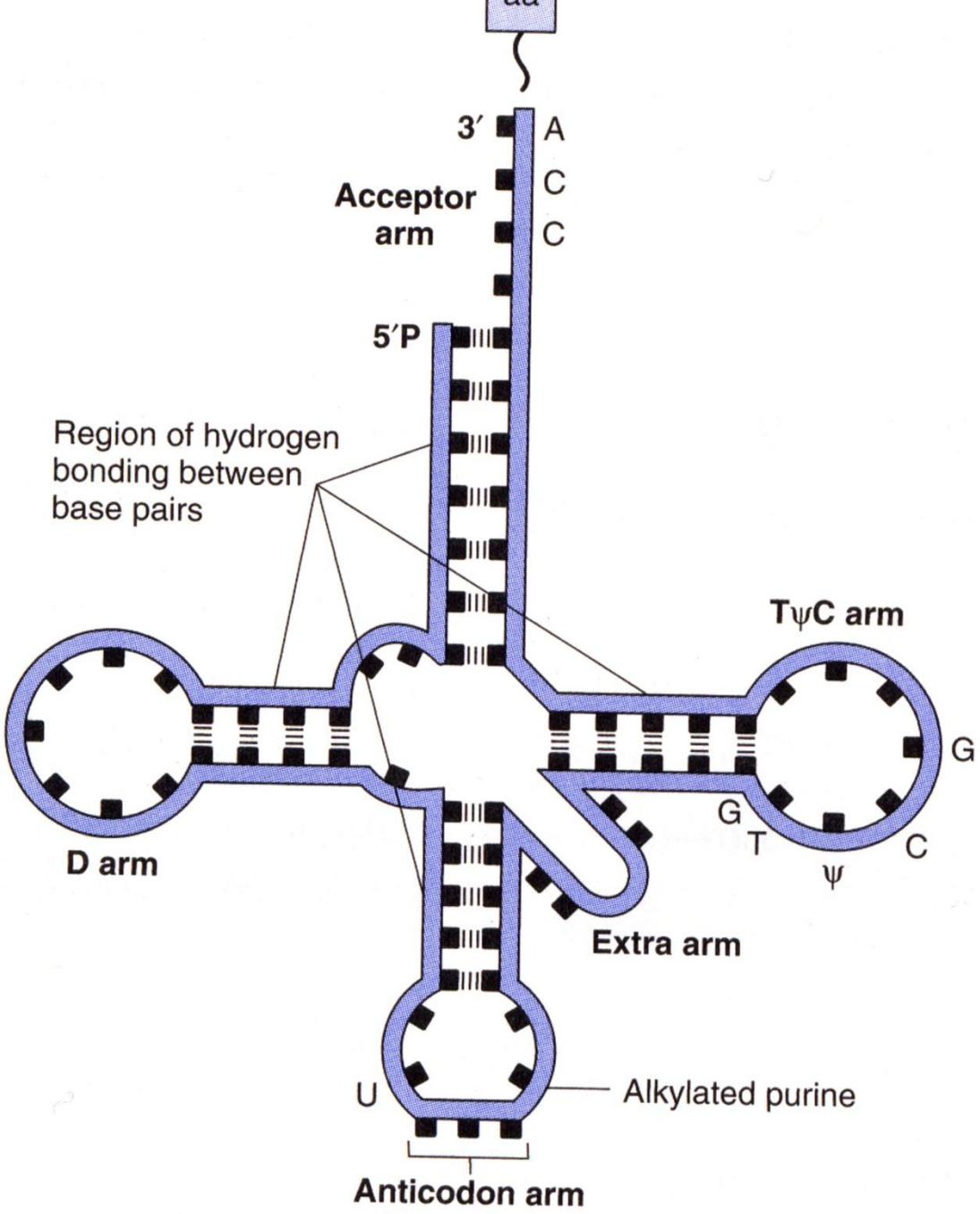
Coding,Noncoding,Template strand and the RNA Transcript



The Flow of Information




OH
OH
C
C
H
H
HC
CH
O
H_2N
N
N
HN
O
N
CH_3
H_2C
5′
O
O^-
P
O
O
P
O
O^-
O
P
O
O^-
5′
CH_2
O
CAP
NH_2
N
N
N
N
O
HC
CH
H
H
3′
C
C
2′
OCH_3
O
NH
O
N
mRNA
5′
CH_2
O
O
P
O
O^-
O
HC
CH
H
H
3′
C
C
OH
O
P
O
O^-


aa
3′
A
C
C
Acceptor arm
5′P
Region of hydrogen bonding between base pairs
TψC arm
G
G
T
C
ψ
D arm
Extra arm
U
Alkylated purine
Anticodon arm