i. Hydrogen bonding
ii. Electrostatic interactions
iii. Van der Waals forces

b. Anti-parallel
c. Helical dimensions
d. Major and Minor grooves

D. Different DNA conformations
1. B DNA
2. A DNA
3. Z DNA
4. Intercalating agents
a. Types of intercalating agents
b. Denaturation and renaturation of DNA secondary structure
c. Tertiary structure
i. Supercoiling
d. Eukaryotic chromosome
i. Nucleosome

III. The transfer of information

A. Central Dogma
B. DNA Replication
1. Features of Replication
a. Origin of replication
b. Bidirectional
c. Replication occurs 5’-3’
d. Helix is unwound by helicase
e. Replication is semidiscontinuous
2. Enzymology of Replication
a. *E. coli* DNA polymerase
i. DNA Polymerase I
ii. DNA Polymerase III
3. Mechanisms of replication in *E. coli*
4. DNA replication is Eukaryotes
C. RNA Replication
D. Transcription and translation overview
E. Genetic Recombination Introduction
1. Homologous recombination
2. Non-homologous recombination
3. Transposition

IV. Mutagenesis

A. Point Mutations
1. Spontaneous DNA damage
2. Base mispairing
3. UV irradiation
4. Chemical mutagen
5. Alkylating agents
B. Insertion (or deletion)