

**BIOS 452/CHEM 452
TOPICAL SUMMARY
EXAM 1**

NUCLEIC ACIDS

DNA and RNA

Nucleotide and nucleoside structures and nomenclature

Structure and stereochemistry of 2-deoxy-D-ribose

Fischer and Haworth projections

Cyclization (formation of cyclic hemiacetal)

Anomers of cyclic form of D-ribose

Nucleotide base tautomerization

Purine and pyrimidine acid/base equilibria

Covalent bonding between nucleotides in DNA and RNA

Acid/base ionization of the phosphodiester group

DNA hydrolysis by endonucleases

Cloning (restriction hydrolysis, ligation, transformation, selection)

DNA gel electrophoresis

Primary structure determination of DNA – Dideoxy (Sanger) method

DNA fingerprinting

RFLP analysis

STR analysis

Secondary structure of DNA

Complementarity and base pairing

Structural features of B-form DNA

Handedness

Rotation per base pair

Base pairs per turn

Rise per base pair

Pitch

Conformation of glycosidic bond

Sugar Pucker

Stability and helix-coil transition

Tertiary structure of DNA and RNA

Supercoiling of circular DNA

Self-complementarity of RNA

Flow of genetic information

Transcription

Translation/genetic code

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PROTEINS

Peptide bond

Amino Acids

Structure

Abbreviations

Stereochemistry

Acid dissociation equilibria

pK_a values

Hydrophobic effect

Hydrophobic (VDW) interactions

Hydrogen bonding

Salt bonding

Metal ligand bonding

Stereochemistry

Aromatic Absorption Spectra

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