BIOS 452/CHEM 452
TOPICAL SUMMARY
EXAM 2

PROTEINS

- Amino Acid Analysis
  - Hydrolysis of Peptide Bonds
  - Separation of Amino Acids
    - Ion Exchange Chromatography
    - Reverse Phase Chromatography
  - Quantitation

- Primary Structure Determination
  - N-Terminal Methods
    - Sanger
    - Dansyl Chloride
    - Edman
    - Exopeptidases
  - C-Terminal Methods
    - Exopeptidases
    - Hydrazine
  - Endopeptidases
  - Cyanogen Bromide
  - Disulfide Bonds
  - Protein Separation
    - Ion Exchange Chromatography
    - Reverse Phase Chromatography

- Secondary structure
  - Peptide Backbone Bond Angles/Distances
  - *cis* and *trans* Configurations
  - Φ and Ψ angles
  - Ramachandran plot
  - Stabilization by peptide H-bonding
  - 3_{10}
  - α helix and Keratin
  - β-sheets (parallel and anti-parallel) and Silk
  - Turns
  - Collagen
  - Relation to composition and sequence

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- Tertiary structure
  - Stabilization by side-chain interactions
  - Hydrophobic effect/Micelle model
  - Hydrogen bonding
  - Salt bonds
  - Metal ligand interactions
  - Disulfide bonds

- Quaternary structure

- Structure and Function
  - Reversible O_2 binding to Mb, Hb
  - Hyperbolic and sigmoidal binding curves
  - Allosteric effects

CARBOHYDRATES

- Monosaccharides
  - Aldoses/ketoses
  - D, L configuration
  - Open chain and hemiacetal/hemiketal forms
  - Furanose and pyranose forms
  - Haworth representation
  - α, β anomers
    - Structure
    - Stability

  - Disaccharides
    - Acetal/ketal formation
    - α/β configuration
    - Haworth representation

  - Polysaccharides
    - Amylose and cellulose
    - α/β configuration
    - Haworth representation