

Intro to Bioinformatics – Final Review

Chapter 1: pages 13-31

Protein Structure

Primary

Secondary

Tertiary

Quaternary

Numbering

Amino Terminus NH → COOH Carboxy Terminus

Properties of amino acids

Valence

Electronegativity

Hydrophobicity/Hydrophilicity

Tools of Molecular Biology

Restriction Enzyme Digests

Gel Electrophoresis

Blotting

Hybridization

Cloning

PCR

DNA Sequencing

Chapter 6

Prokaryotic Gene Structure

Eukaryotic Gene Structure

GC Content

Prokaryotic

Eukaryotic

Open Reading Frames

Gene Expression

Transposition

Repetitive Elements

Gene Density

Chapter 7

Amino Acid vocabulary

- backbone
- alpha carbon
- side chain
- polar a.a.
- charged a.a.
- hydrophobic a.a.
- native structure
- denatured
- peptide

Secondary Structure

- Backbone flexibility
- psi and phi angles
- Prediction methods
 - Chou-Fasman method
 - GOR method

Tertiary and Quaternary Structure

- hydrophobic collapse
- disulfide bonds
- stable structures
- modeling protein folding
 - lattice models
 - off-lattice models
- structure prediction
 - homology modeling
 - threading (reverse protein folding)

Predicting RNA secondary structures

Chapter 8

Protein Classification

- Enzyme classes
- SCOP
- CATH
 - families and superfamilies
 - folds

Experimental techniques

- 2D electrophoresis
- Mass Spectrometry

MALDI
Peptide mass fingerprint

Protein Microarrays
X-ray Crystal structures
Nuclear Magnetic Resonance (NMR)

Empirical Methods and Prediction Techniques
labeled feature vector