Study Guide for MICA 8006 Week 1

This study guide covers week one lectures and assigned readings from Brandon & Tooze (Chapters 1-2) and Tramontano (Introduction). It does NOT include UNIX, Perl or GCG syntax, or other topics discussed only in lab sessions.

Study questions (some mid-term exam questions may be similar to these):

1. Define: genetic code; stop codon; start codon; posttranslational modifications; enzyme active site.

2. What is meant by the degeneracy of the genetic code?

3. What are the names, 3-letter codes, 1-letter codes, physical properties, and chemical structures for all 20 common amino acids?

4. Define: amino acid; peptide bond; phi angle; psi angle; Ramachandran plot; alpha helix; dipole moment; beta strand; hairpin turn; primary sequence; secondary structure; tertiary structure; quaternary structure; structural classes: all alpha, all beta, alpha-beta alternating, alpha + beta; domain; motif.

5. How many residues are in one turn of an alpha helix? What is the approximate distance between consecutive C_α carbons in a protein?

6. What is the dipole moment of an alpha helix? a helical wheel? an amphipathic (amphiphilic) alpha helix? a parallel beta sheet? an antiparallel beta sheet?

7. Define: EMBL, DDBJ, GenBank; PIR, Swiss-Prot, GenPept, RefSeq, UniProt; PDB.

8. What is the approximate present doubling time for the number of sequences in DNA databases?