Homework problems: week of November 7
From book:
Chapter 15 problems: 24, 26, 40, 41
Chapter 14 problems: 12, 23, 26, 27, 30, 34

To Hand in (week of November 7):

1. Hydroxylamine is a chemical that causes exclusively C→T transition mutations. Can nonsense mutations (UAA, UAG, UGA) be reverted with hydroxylamine? Explain. (pictures are worth a thousand words)

2. The following nucleotide-sequence is found on the template strand of DNA. First, determine the amino acid sequence of the protein encoded by the sequence of DNA, using the genetic code. Then, give the altered amino acid sequence of the protein that will be found in each of the following mutations.

DNA sequence of the template:

3’-TAC TGG CCG TTA GTT GAT ATA ACT – 5’

a) Mutant 1: A transition at nucleotide 11

b) Mutant 2: A T→A transversion at nucleotide 15

c) Mutant 3: a transition at nucleotide 9

3. A wild type chromosome has the following structure:

A B C * D E F G H

An individual is heterozygous for the following chromosome mutations. For each mutation, sketch out how the wild type and mutant chromosome would pair during prophase of meiosis I, showing all chromosome strands. (* indicates the centromere)

Mutant 1: A B C * D G F E H

Mutant 2: A B E D * C F G H

What would be the meiotic products if a recombination occurred between E and F in a heterozygote containing a wild type chromosome and the chromosome in Mutant 1?