Molecular Mechanisms of Recombination

I. Forms of Recombination
      Nonhomologous
      Homologous
      Homeologous (ectopic)

II. Molecular Requirements
      Homology between Recombining Sequences
      Heteroduplex Formation (Synapse)
      Resolution of the Heteroduplex

III. Molecular Models of Recombination
      Holliday Double-Strand Invasion Model
      Single Strand Invasion Model
      Doubles Strand Break Repair Model
      Replication Initiation Model **(not in book)

IV. Enzymes Involved in Recombination
      RecA
          a strand pairing enzyme
      RecBCD (and the chi site)
          a double strand DNA helicase/nuclease
      RuvAB or RecG
          branch migration of holliday junctions
      RuvC
          a nuclease that resolves holliday junctions
      Other recombination genes
          RecFOR: a backup gene or new function
          RecJ RecQ: another helicase nuclease combo
         RecE: a nuclease from a cryptic phage?
      Homologous activities from phage that use recombination
      red gam of phage lambda
      uvsX of phage T4

V. Isolating *rec-* mutants
      A tricky negative selection

VI. The Complications of Mismatch Repair
      Gene Conversion
      Interspecies Recombination (Less Homologous Recombination) **(not in book)