Chapter 11 – Site-specific Recombination and Transposition of DNA

Know difference between CSSR (conservative site-specific recombination) and transposition

3 possible outcomes of CSSR: insertion, deletion, inversion
direct repeats on ends of element means insertion/deletion
inverted repeats on ends of element means inversion
recombination sites on ends of element are recognized by recombinase enzyme
properties of recombinases:
- two types of recombinases: serine and tyrosine
- covalent intermediates between recombinase and cut ends
- different mechanisms used for serine and tyrosine classes
several examples of CSSR:
- bacteriophage lambda insertion/excision to make prophage (lysogeny pathway)
  lambda integrase (tyrosine family recombinase), attP and attB sites
- bacteriophage P1 circularization using Cre recombinase and loxP sites
  used to make conditional knockouts in mice; what is utility of this?
- Salmonella flagellar switching: two types of flagellin (H1, H2): why?
  Hin recombinase
  Understand how switching of element regulates expression of H1 vs. H2
  flagellins.

Relative amounts of transposons in various genomes
3 classes of transposons: know basic outline of each
- DNA transposons
- Virus-like retrotransposons
- Poly-A retrotransposons
Understand basic mechanisms of DNA transposition (both cut-and-paste and replicative); examples of each type
Understand basic mechanism of transposition by virus-like retrotransposons and example
Understand basic mechanism of transposition by poly-A retrotransposon
  Examples are mammalian LINEs and SINEs; what is difference between autonomous and nonautonomous transposon?