Lecture 6, BIOL 2030 Fall '09

Chapter 5 Problems: 3, 4, 5, 6, 8, 9, 12, 15, 17, 19, 20, 21, 23, 24, 26
Also recommended: 7, 10, 11, 13, 14, 18, 22, 25

I. Linkage
- A. Ind. Assortment = Ind. Alignment of heterologs at MI
- B. What if genes are on same chromosome?
  - A. Can show linkage (tendency of genes to maintain parental configuration)
  - B. Sturtevant proposed that strength of association (P combination) was a measure of how close genes are
  - C. Non-P (recombinants) is a measure of separation
    - i. distance (map units) = 100*R/(P+R)
    - ii. distances are additive (chromosomes are linear)
  - D. Placement of genes along a line in accordance with the frequencies with which they recombine is a genetic map
- C. Are two genes linked? (Are P > R? Use Chi^2 test)
- D. Determination of gene order
  - A. Can get by multiple combinations
  - B. Much easier with 3 factor (or 3 point) testcross
  - C. Mapping without a testcross

II. 3 pt. mapping procedure
- A. P most frequent
- B. dco least frequent
- C. order given by dco
- D. distances given by 100*(sco + dco)/total for each interval
  - •note – dco have one of their exchanges in the interval, ideal map accounts for every exchange within an interval

III. Fundamental properties of meiotic exchange
- A. x-over at 4-strand stage (after replication, before MI segregation)
- B. no chromatid interference
- C. there is chiasma interference

IV. Consequences
- A. max. directly measurable XO is 50%
- B. can determine the frequency of different meiotic events
- C. possible to go from results of testcross to determination of meiotic events, or from frequency of meiotic events to map