

Week 2 Pedigrees and Genetic Linkage

Learning Goal: Appreciate how the process of meiosis and the physical nature of chromosomes contributes to patterns of inheritance

After the pre-class assignments you should be able to:

- Define the addition (i.e., sum) rule and the multiplication (i.e., product) rule
- Explain how incomplete dominance and epistasis affect the inheritance of a trait
- Define the terms X-linked gene and Y-linked gene
- Explain the experimental processes of DNA fingerprinting using VNTR analysis
- Diagram the process of homologous recombination and explain how it can lead to new combinations of linked alleles
- Differentiate between the utility of mtDNA, Y-chromosome DNA, and autosomes for examining ancestry

By the time you take the first midterm you should also be able to:

- Create a pedigree from a scenario
- Use pedigree analysis to calculate the likelihood an individual will have a particular genotype or phenotype
- Distinguish between dominant, recessive, autosomal, X-linked patterns of inheritance using pedigrees
- Interpret the results of crosses and pedigrees whose results differ from Mendelian expectations because of incomplete dominance, epistasis, or hierarchy of dominance
- Analyze VNTR DNA fingerprinting data to determine the genotypes and/or relatedness of individuals
- Determine if and where homologous recombination has occurred based on combinations of linked alleles