

I. Population Genetics

- A. Assumes large, randomly-mating population
- B. Probabilities of genotypes and phenotypes controlled by allele frequencies (p and q)
- C. Hardy-Weinberg equilibrium describes these frequencies in population with no evolutionary forces acting (expansion of $(p + q)^2$ for two alleles)
- D. Evolutionary forces could be: selection, drift, mutation, migration, inbreeding

II. Pedigree analysis

- A. Used for interpreting small numbers, such as human inheritance
- B. Four types of inheritance
 - i. autosomal (like Mendel): dominant and recessive
 - recessive – parents need not be affected, but must both be carriers
 - dominant – at least one parent is affected
 - ii. sex-linked:
 - recessive: affects males more frequently than females
 - dominant: males and females both affected (actually $f > m$), affected male has affected mother, all daughters of affected male are affected
- C. Probabilities according to Mendel
 - i. each child is independent!
 - ii. rare recessive traits appear more often in matings to relatives