

Week 3: Genetic and Environmental Basis of Complex Traits

Learning Goal: Appreciate gene and environment interactions

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

- Explain how genetic distance is different from physical distance on a chromosome
- Explain why the measured recombination frequency between any two genes is never greater than 50%
- Define the terms SNP, VNTR, RFLP, and genetic marker
- Explain and discuss how various factors might influence the relationship between genotype and phenotype
- Explain how non-disjunction, recombination, and gene by environment interactions can complicate pedigree analysis
- Describe how variation can be measured, and what can be done to distinguish genetic and environmental sources of variation
- Explain how continuous traits produce phenotypes

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

- Calculate genetic map distances among linked genes from the frequencies of progeny with recombinant phenotypes, and construct a genetic map from data provided
- Evaluate whether a specific SNP or VNTR is associated with a specific disease
- Compare and contrast the inheritance of germline and somatic mutations
- Interpret experiments to determine the relative influences of genes versus the environment on a given phenotype
- Evaluate how genes and the environment can interact to influence a phenotype
- Relate trait values of offspring to parents to identify heritability of traits