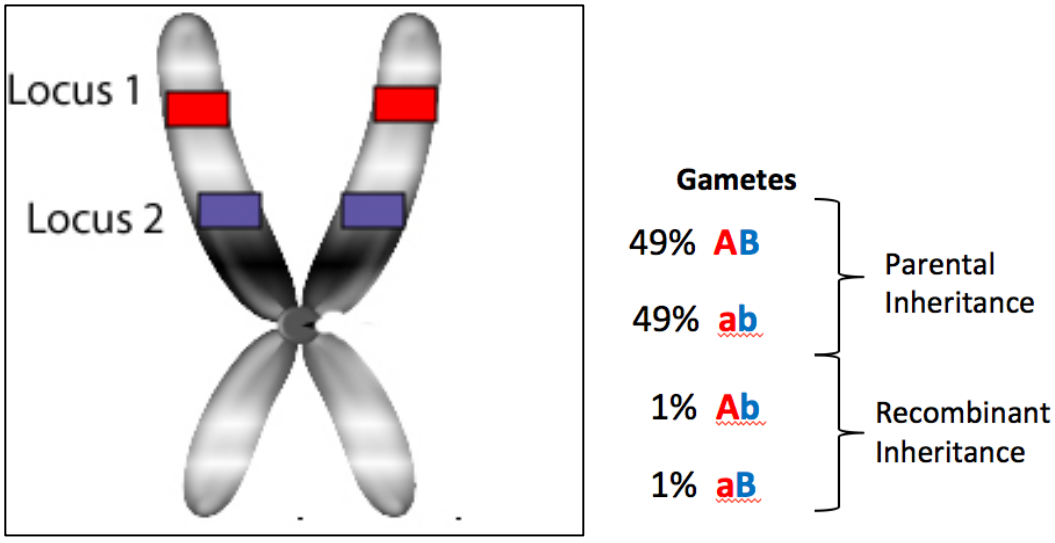
Linkage disequilibrium

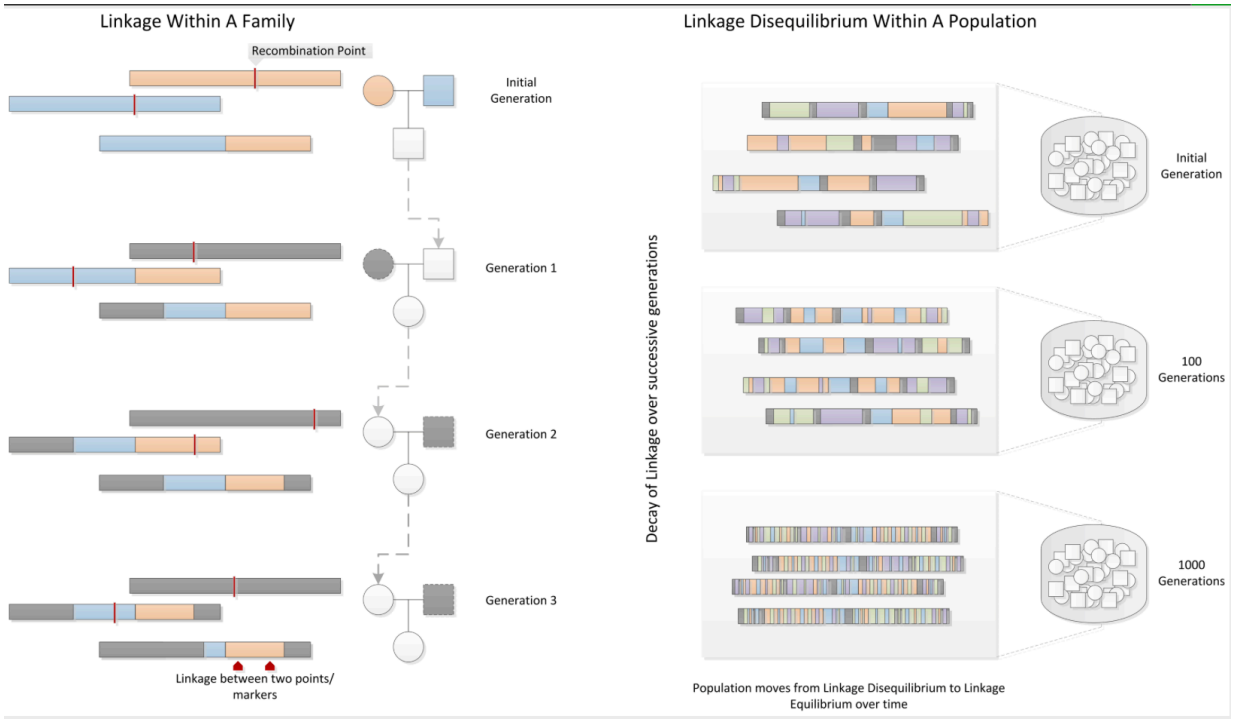
***Linkage Disequilibrium (LD)*:** the non-random association of alleles at two or more loci, that may or may not be on the same chromosome[50]



Recombination rate ~ 1% for 1 million base pairs

Linkage disequilibrium is the non-random association of alleles at different loci.[1] More explicitly, it's a trait of SNPs on a contiguous stretch of genomic sequence and it's used to describe how much an allele of a specific SNP is inherited or correlated with an allele of another SNP in the population.

Here is a picture that might help. Within a family, linkage occurs when two genetic markers remain linked on a chromosome rather than being broken apart by recombination events during meiosis.(red lines) Within a population, contiguous stretches of founder chromosomes will decrease in size due to the recombination events. As time goes on, recombination events gradually occur between every possible point on the chromosome, a pair of markers of a chromosome in the population changes from linkage disequilibrium to linkage equilibrium.


Linkage Within A Family
Recombination Point
Initial Generation
Generation 1
Generation 2
Generation 3
Linkage between two points/ markers
Linkage Disequilibrium Within A Population
Decay of Linkage over successive generations
Initial Generation
100 Generations
1000 Generations
Population moves from Linkage Disequilibrium to Linkage Equilibrium over time