

Transmission Genetics: Mendel and Beyond

A. Mendel's Work

1. Plant breeders control which plants mate
2. Mendel's discoveries lay dormant for decades

B. Mendel's Experiments and Laws of Inheritance

1. Mendel prepares to experiment
2. Mendel's Experiment 1 examined a monohybrid cross
3. How Mendel interpreted his results
4. Mendel's first law says that alleles segregate
5. Mendel verified his experiment by performing a test cross
6. Mendel's second law says that alleles of different genes assort independently
7. Punnett squares or probability calculations? You choose!

C. Alleles and Their Interactions

1. Dominance is usually not complete
2. Some alleles have multiple phenotypic effects
3. New alleles arise by mutation
4. Many genes have multiple alleles

D. Gene Interactions

1. Some genes alter the effects of other genes
2. Polygenes mediate quantitative inheritance
3. The environment affects gene action

E. Genes and Chromosomes

1. Linked genes are near each other on a chromosome
2. Genes can be exchanged between chromatids
3. Geneticists make maps of eukaryotic chromosomes
4. Sex is determined in different ways in different species
5. X and Y chromosomes have different functions
6. Genes on sex chromosomes are inherited in special ways
7. Mendelian ratios are averages, not absolutes

F. Cytoplasmic Inheritance