

Lecture 17 – Simple Mendelian Genetics

■ Mendel's Laws

1. First Law

- a. Different versions of inherited characteristics are carried by alternate versions of a gene
- b. An organism inherits two alleles for each characteristic – one from each parent
- c. If alleles differ, one is dominant and the other is recessive
- d. Law of Segregation: The two alleles separate during gamete formation and are distributed to different gametes
- e. Homologous chromosomes have the two alleles for each characteristic
  - i. Alternate forms of a gene reside on the same locus on homologous chromosomes

2. Second Law

- a. Law of Independent Assortment: When two or more characteristics are inherited, each pair of alleles segregates into gametes independently

■ Genetic crosses can be calculated using a Punnett Square

- 1. Write down the phenotype
- 2. Write down the genotype
- 3. Write down the gametes
- 4. Work out the cross results

■ The Test-Cross

- a. Used to find out genotype of a parent when only phenotype is known

■ Mendelian inheritance follows rules of probability

- a. Each event is independent of all other events
- b. Each event has a 50% chance of being either outcome