

Chapter 4: Modern Genetics Outline

I. Human Inheritance

- A. Some human traits are controlled by single genes with two alleles, and others by single genes with multiple alleles. Still other traits are controlled by many genes that act together.
- B. The sex chromosomes carry genes that determine whether a person is male or female. They also carry genes that determine other traits.
- C. Many of a person's characteristics are determined by an interaction between genes and the environment.
- D. Terms
 - a. Multiple alleles
 - b. Sex chromosomes
 - c. Sex-linked gene
 - d. Carrier

II. Human Genetic Disorders

- A. Some genetic disorders are caused by mutations in the DNA of genes. Other disorders are caused by changes in the overall structure or number of chromosomes.
- B. One important tool that geneticists use to trace the inheritance of traits in humans is a pedigree.
- C. Today doctors use tools such as karyotypes to help detect genetic disorders. People with genetic disorders are helped through medical care, education, job training, and other methods.
- D. Terms
 - a. Genetic disorder
 - b. Pedigree
 - c. Karyotype

III. Advances in Genetics

- A. Selective breeding, cloning, and genetic engineering are three methods for developing organisms with desirable traits.
- B. The main goal of the Human Genome Project has been to identify the DNA sequence of every gene in the human genome.
- C. Terms
 - a. Selective breeding
 - b. Inbreeding
 - c. Hybridization
 - d. Clone
 - e. Genetic engineering
 - f. Gene therapy
 - g. genome