

Section 1: Basic Patterns of Human Inheritance

MAIN IDEA

The inheritance of a trait over several generations can be shown in a pedigree.

K <i>What I Know</i>	W <i>What I Want to Find Out</i>	L <i>What I Learned</i>

Essential Questions

- How can genetic patterns be analyzed to determine dominant or recessive inheritance patterns?
- What are examples of dominant and recessive disorders?
- How can human pedigrees be constructed from genetic information?

Vocabulary

Review

- genes

New

- carrier
- pedigree

Recessive Genetic Disorders

- A recessive trait is expressed when the individual is homozygous recessive for the trait.
- Those with at least one dominant allele will not express the recessive disorder.
- An individual who is heterozygous for a recessive disorder is called a **carrier**.

Review of Terms



Interactive Table

FPO

Add link to interactive table from page 296 (Table 1) here.

Recessive Genetic Disorders in Humans



Interactive Table

FPO

Add link to interactive table from page 297 (table 2) here.

Recessive Genetic Disorders

Cystic fibrosis

- A disorder that affects the mucous-producing glands, digestive enzymes, and sweat glands.
- Chloride ions are not properly transported out of cells of a person with cystic fibrosis.
- Cystic fibrosis causes mucus excretion that clogs ducts in the pancreas, interrupts digestion, and blocks respiratory pathways in the lungs.

Recessive Genetic Disorders

Albinism

- Albinism is caused by altered genes, resulting in the absence of the skin pigment melanin in hair and eyes.
- Individuals with albinism have very pale skin, white hair, and pink irises.

Recessive Genetic Disorders

Tay-Sachs disease

- Caused by the absence of the enzymes responsible for breaking down fatty acids called gangliosides
- Gangliosides accumulate in the brain, inflating brain nerve cells and causing mental deterioration.

Recessive Genetic Disorders

Galactosemia

- Recessive genetic disorder characterized by the inability of the body to digest galactose.
- Inability to digest milk products

Dominant Genetic Disorders

Huntington's disease

- Affects the nervous system, causing gradual loss of brain function
- Occurs in 1 out of every 10,000 people in the US

Achondroplasia

- Causes small body size and limbs that are comparatively short
- Caused by an abnormal gene that affects bone growth

Dominant Genetic Disorders in Humans



Interactive Table

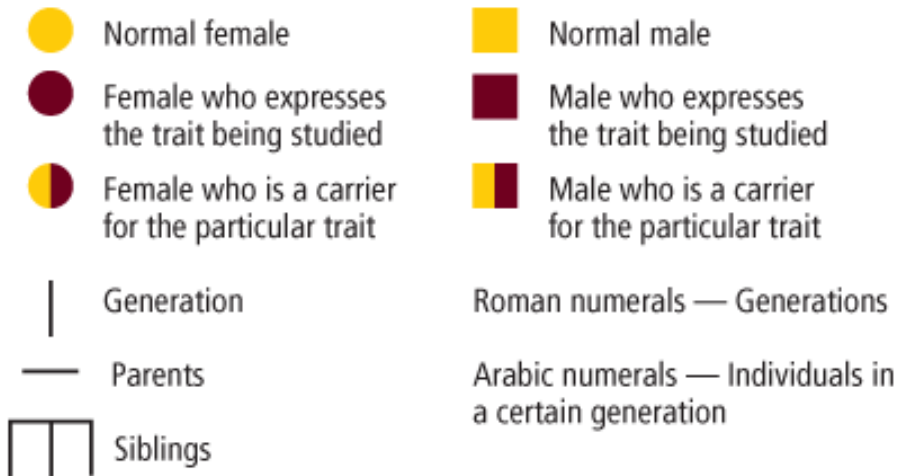
FPO

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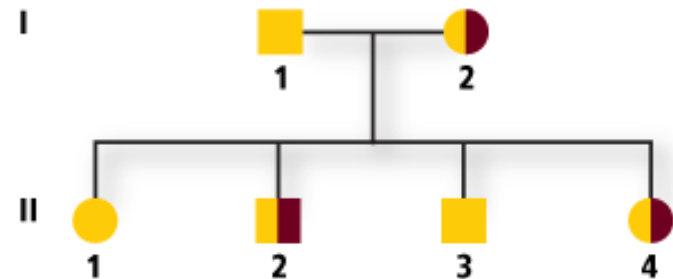
Pedigrees

- A **pedigree** is a diagram that traces the inheritance of a particular trait through several generations.

Key to Symbols



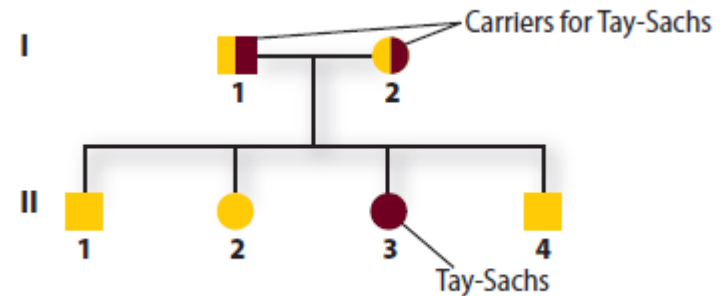
Example Pedigree



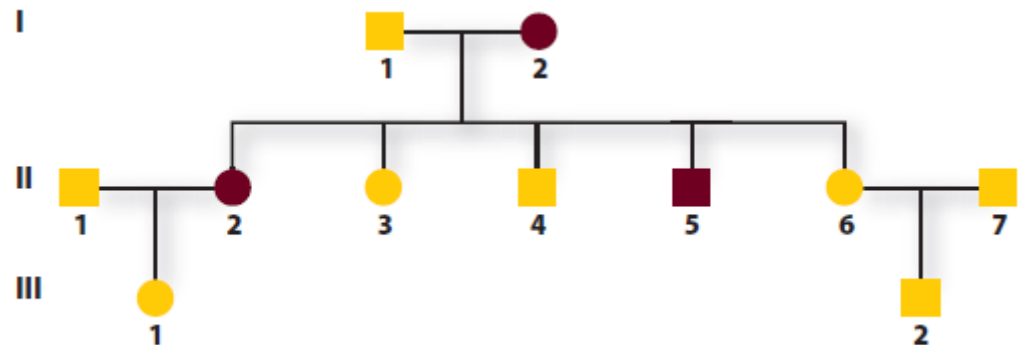
Analyzing Pedigrees

- Pedigrees can be used to examine both recessive and dominant genetic disorders.
- Information about an individual's genotype can be inferred from the phenotype of his/her parents and offspring.

Recessive disorder



Dominant disorder



Analyzing Pedigrees

Inferring Genotypes

- Knowing physical traits can determine what genes an individual is most likely to have.

Predicting Disorders

- Record keeping helps scientists use pedigree analysis to study inheritance patterns, determine phenotypes, and ascertain genotypes.

Review

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