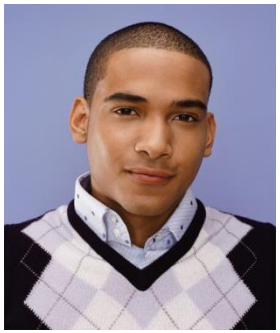
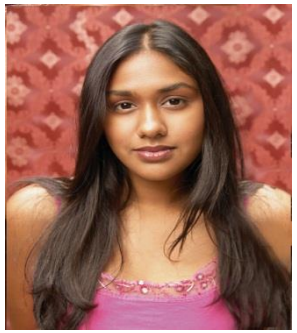
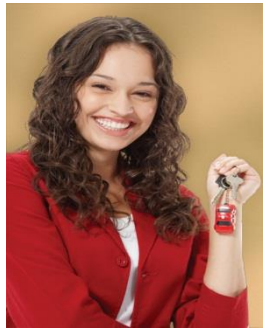
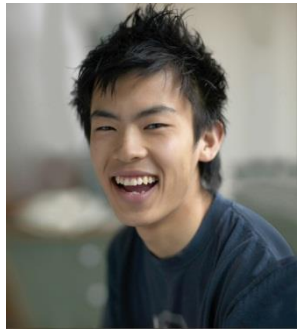
7.4 Human Genetics and Pedigrees

KEY CONCEPT

A combination of methods is used to study human genetics.

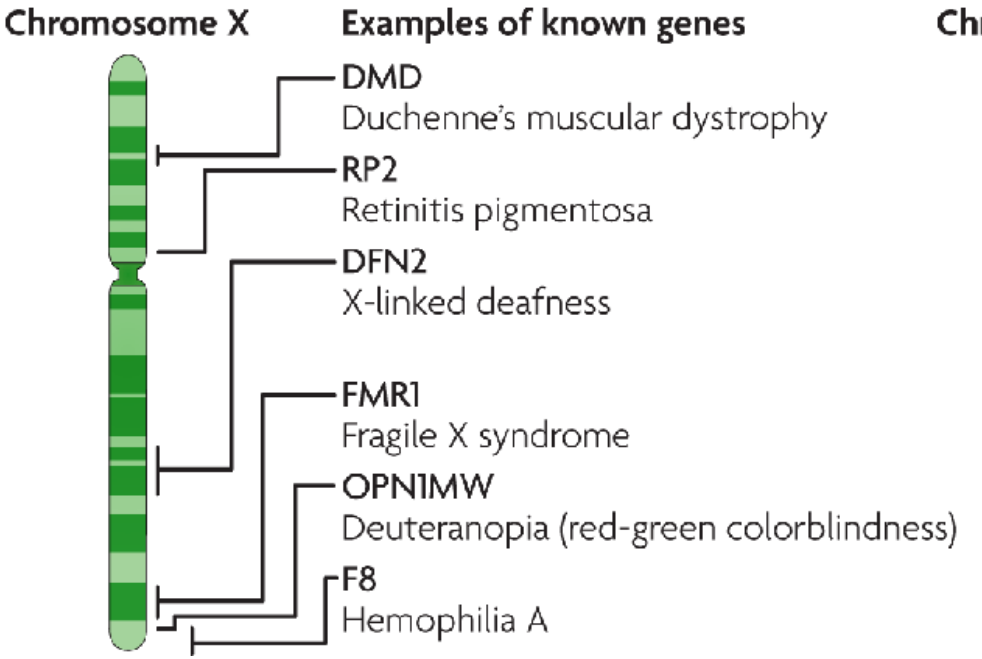

7.4 Human Genetics and Pedigrees

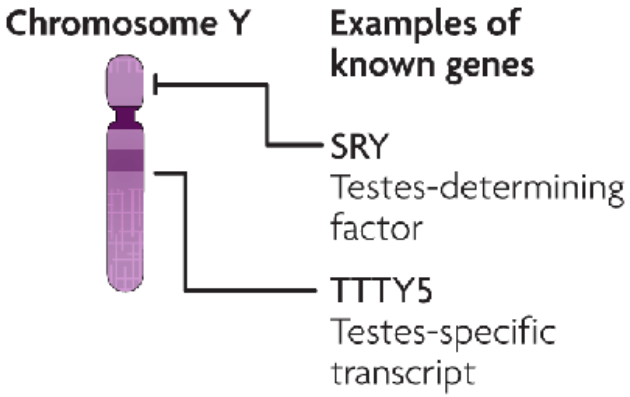
- **A combination of methods is used to study human genetics**
  - The basic principles of genetics are the same in all sexually reproducing organisms.
    - Inheritance of many human traits is complex.
    - Single-gene traits are important in understanding human genetics.

7.4 Human Genetics and Pedigrees

Females can carry sex-linked genetic disorders.

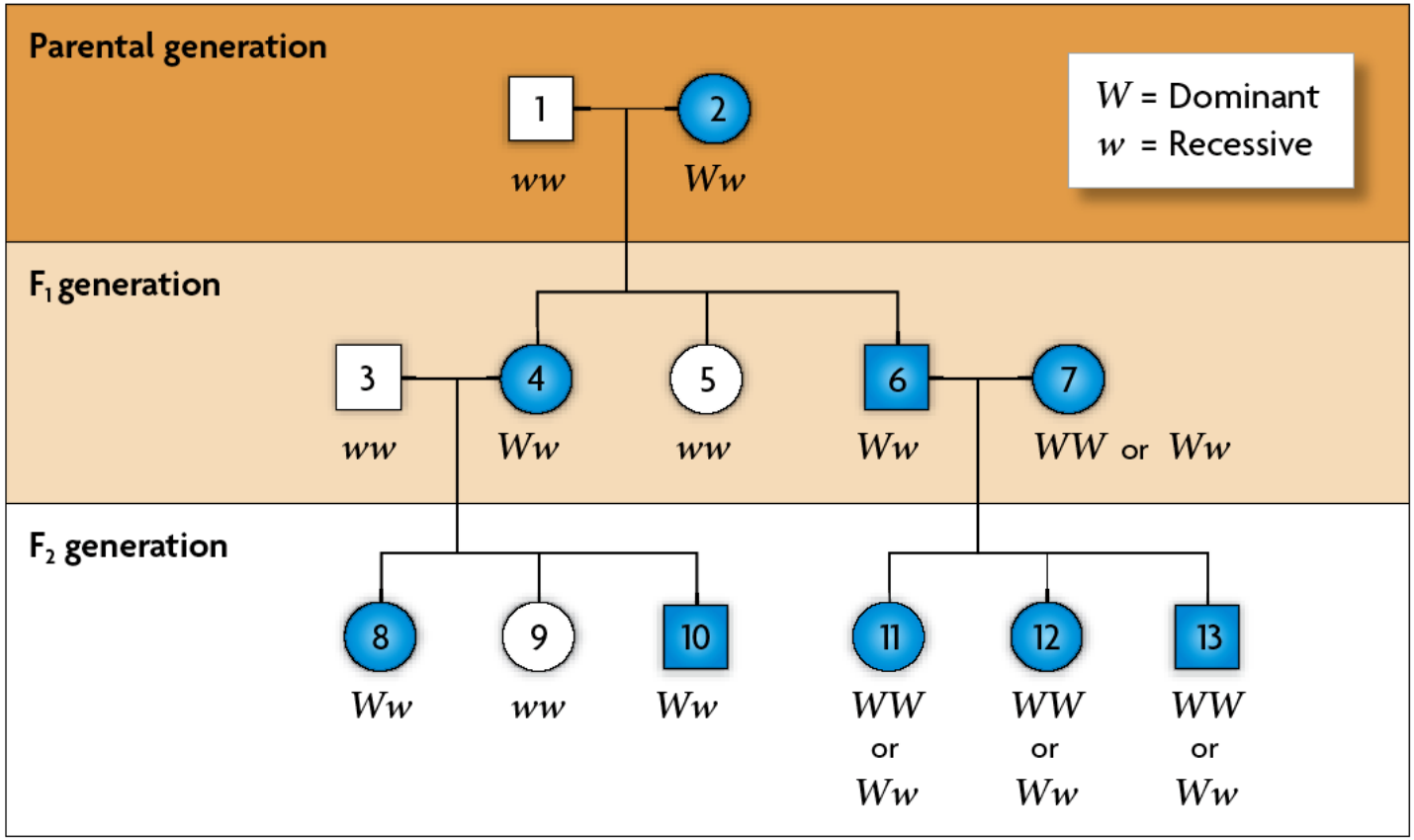
- Males (XY) express all of their sex linked genes.
- Males tend to show sex-linked disorders more than females





7.4 Human Genetics and Pedigrees

- **A pedigree is a chart for tracing genes in a family.**
  - Phenotypes are used to infer genotypes on a pedigree.
  - Autosomal genes show different patterns on a pedigree than sex-linked genes.



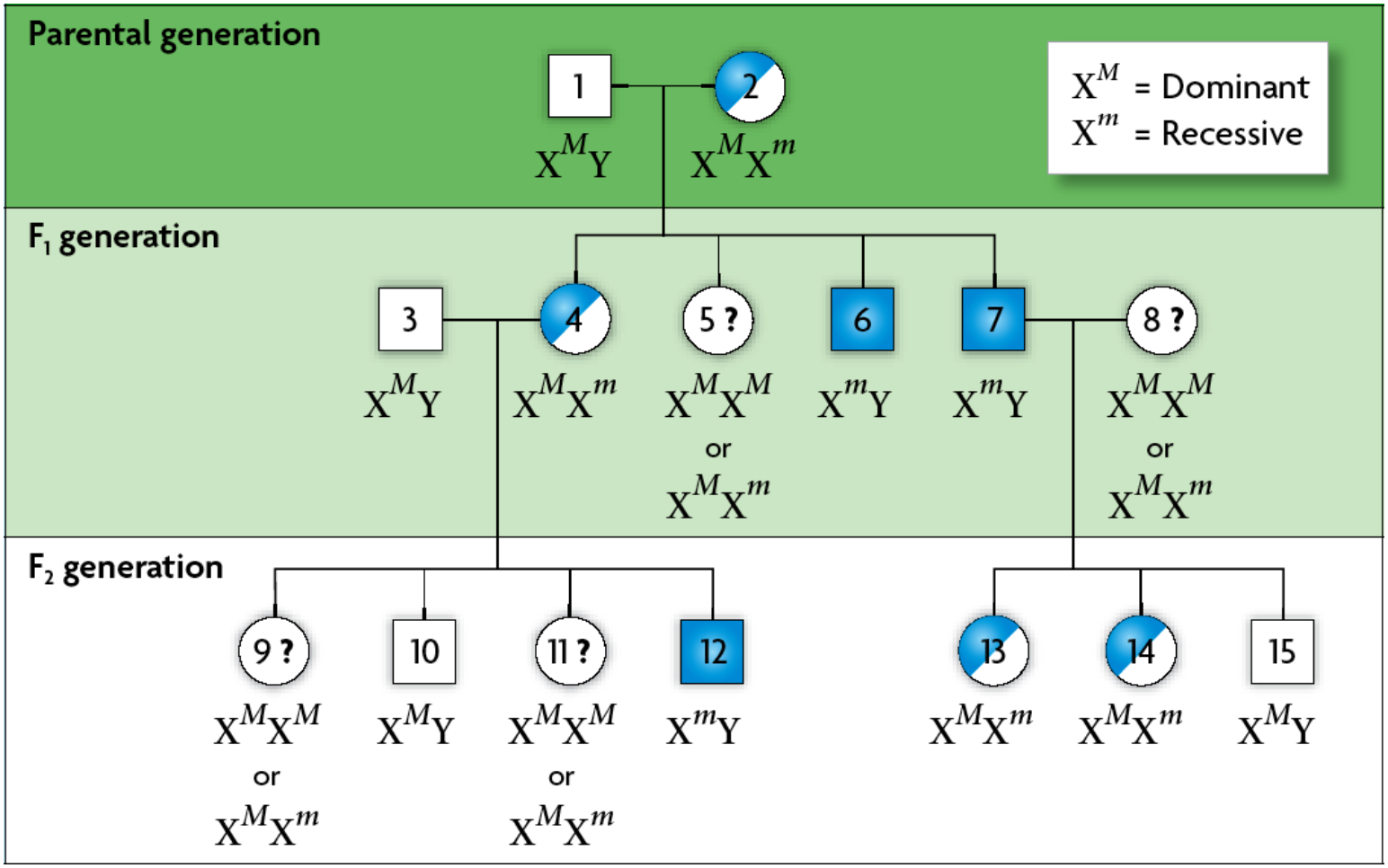
7.4 Human Genetics and Pedigrees

How do we read a pedigree chart?

- □ = Males
- ○ = Females
- Horizontal lines between a male and female signify marriage
- Horizontal lines above males and females signify offspring
- Vertical lines signify children of a couple
- Colored in shapes mean the person has the genetic disorder
- Half colored in shape means the person in a carrier

7.4 Human Genetics and Pedigrees

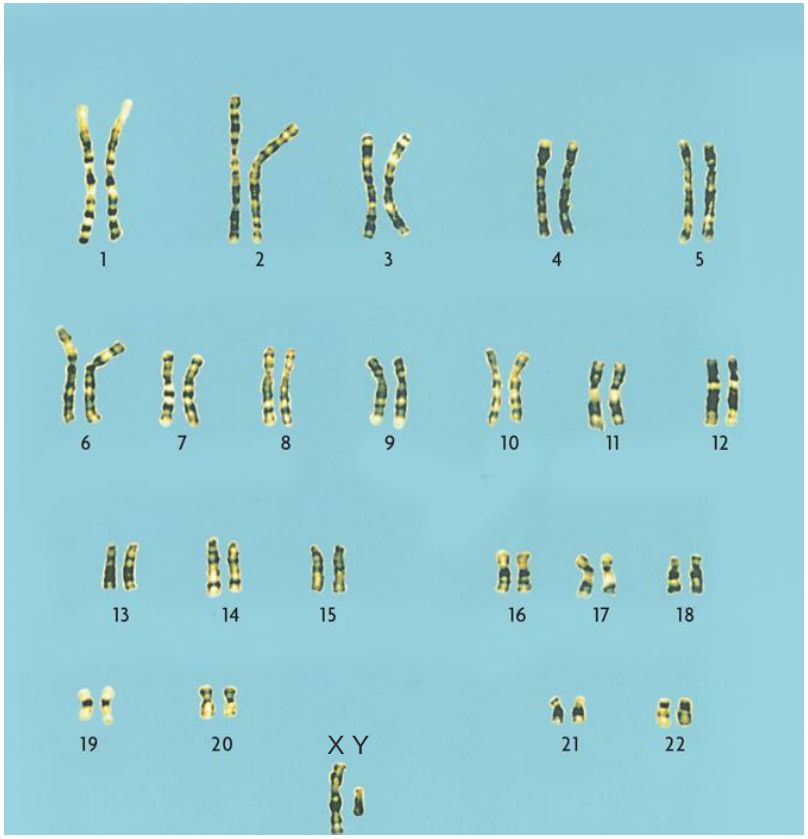
- If the phenotype is more common in males, the gene is likely sex-linked.



7.4 Human Genetics and Pedigrees

Several methods help map human chromosomes.

- A karyotype is a picture of all chromosomes in a cell.



7.4 Human Genetics and Pedigrees

- Karyotypes can show changes in chromosomes.
  - deletion of part of a chromosome or loss of a chromosome
  - large changes in chromosomes
  - extra chromosomes or duplication of part of a chromosome