

I. Chromosomes and Inheritance

- A. Review the terms at the beginning of the chapter.
 - Genes, homologous chromosomes, alleles, crossing over, independent assortment, etc.
- B. Autosomes and Sex Chromosomes
 - 1. _____ determine gender.
 - a. Human females have _____ chromosomes.
 - b. Males have _____ and one Y.
 - 2. Most of the chromosomes are of the same quantity and type in both sexes and are called *autosomes* (44 in humans).
 - This can be visualized in a _____.

II. Sex Determination in Humans

- A. Each human egg will contain _____ autosomes plus one X; but sperm will carry twenty-two autosomes plus *either* an X or Y.
 - 1. X-bearing _____ plus X-bearing _____ produces female offspring.
 - 2. X-bearing egg plus _____ produces male offspring.
- B. The X chromosome obviously codes for _____ traits, but it also carries many genes for nonsexual traits.
 - 1. The Y chromosome carries a _____ gene which leads to formation of the testes.
 - 2. Absence of the male gene in _____ results in formation of ovaries.

III. Examples of Inheritance Patterns

- A. Autosomal Recessive Inheritance
 - 1. The characteristics of this condition are:

- Either parent can carry the _____ allele on an autosome.
 - Heterozygotes are _____, homozygotes are affected.
 - Two heterozygous parents have a _____ percent chance of producing heterozygous children and a _____ percent chance of producing a homozygous recessive child. When both parents are homozygous; all children are affected.
 - 2. *Galactocomia* (the inability to metabolize _____) is an example of autosomal recessive inheritance in which a single gene mutation prevents manufacture of an enzyme needed.
- B. Autosomal Dominant Inheritance
 - 1. The dominant allele is nearly always _____ and if it reduces the chance of surviving or reproducing, its frequency should decrease;
 - _____ onset works against this hypothesis.
 - If one parent is _____ and other is homozygous recessive, there is a 50 percent chance that any child will be heterozygous.
 - 2. _____ is a serious degeneration of the nervous system with an onset from age 40 onward, by which time the gene has (usually) been passed to offspring unknowingly.
- C. X-Linked Recessive Inheritance
 - 1. The characteristics of this condition are:
 - The mutated gene occurs only on the _____ chromosome.
 - Heterozygous females are _____; males are more often affected because of the single recessive allele (on the X chromosome) is not masked by a dominant gene.
 - A normal _____ mated with a female _____ have a 50 percent chance of producing carrier daughters and a _____ percent chance of producing affected sons. In the case of a homozygous recessive female and a normal male, all daughters will be carriers and all sons affected.

- 2. A serious X-linked recessive condition is _____, which is the inability of the blood to clot because the genes do not code for the necessary clotting agents.

- Reading assignment: Focus on Health: Progeria – Too Young to Be Old

IV. Changes in Chromosome Number

● A. Down Syndrome

- Down syndrome results from _____ 21.
- Most children with Down syndrome show mental retardation, and 40 percent have heart defects
- Down syndrome occurs more frequently in children born to women over age 35.

V. Changes in the Number of Sex Chromosomes

● A. Female Sex Chromosome Abnormalities

- 1. Turner Syndrome
 - Females whose cells have only one X chromosome
 - Designated
- 2. Affected Individuals are _____ and have other phenotypic problems such as premature aging and shorter life expectancy.

● B. Male Sex Chromosome Abnormalities

- 1. Klinefelter Syndrome
 - Results in an _____ in the cells (XXY) of these affected males.
 - Sterility slight mental retardation, and body feminization are symptoms.
- 2. XYY Condition
 - The extra Y chromosome in these males does not affect fertility, but they are taller than average and are slightly mentally retarded.
 - Erroneous correlation have linked these persons with predisposition to crime.