Patterns of Inheritance
Part 2

X-Linked Dominant Inheritance

Specific Features

- Affected females are more frequent than affected males
- All daughters of a affected male, will be affected
- Females are usually less severely affected than males
X-Linked Recessive Inheritance

- The trait or disorder should affect males almost exclusively.
- Are transmitted through unaffected carrier females to their sons.
- Male-to-male transmission is not observed.
- Daughters of affected males are obligate carriers.
X-inactivation (lisionization)

- Occurs at around 15 to 16 days' gestation, when the embryo consists of approximately 5000 cells.
- Normally either of the two X chromosomes can be inactivated in any particular cell.
- Thereafter the same X chromosome is inactivated in all daughter cells.
- The inactive X chromosome exists in a condensed form during interphase (bar body).
Variable Expression in Heterozygous Females

Females with X-Linked Recessive Disorders

- Occasionally a woman might manifest features of an X-linked recessive trait.
- Homozygosity for X-Linked Recessive Disorders
- Skewed X-Inactivation
- Numerical X-Chromosome Abnormalities
- X-Autosome Translocations
Y-Linked Inheritance

- Only males are affected.
- An affected male transmits Y-linked traits to all of his sons but to none of his daughters.

Y-Linked Inheritance Specific Features
Mitochondrial Inheritance

- Each cell contains thousands of copies of mitochondrial DNA.
- Mitochondrial DNA has a higher rate of spontaneous mutation than nuclear DNA.
- Mitochondria, and therefore their DNA, are inherited almost exclusively from the mother.
- A number of rare disorders with unusual combinations of neurological and myopathic features.

Mitochondrial Heteroplasmy

- Homoplasmy: no disease.
- Moderate: no disease.
- Severe: disease.
Mitochondrial Inheritance

Sex Influenced

- Autosomal traits that express more frequently in one sex than in another
- Gout and percentile baldness
- Hemochromatosis

Mosaicism