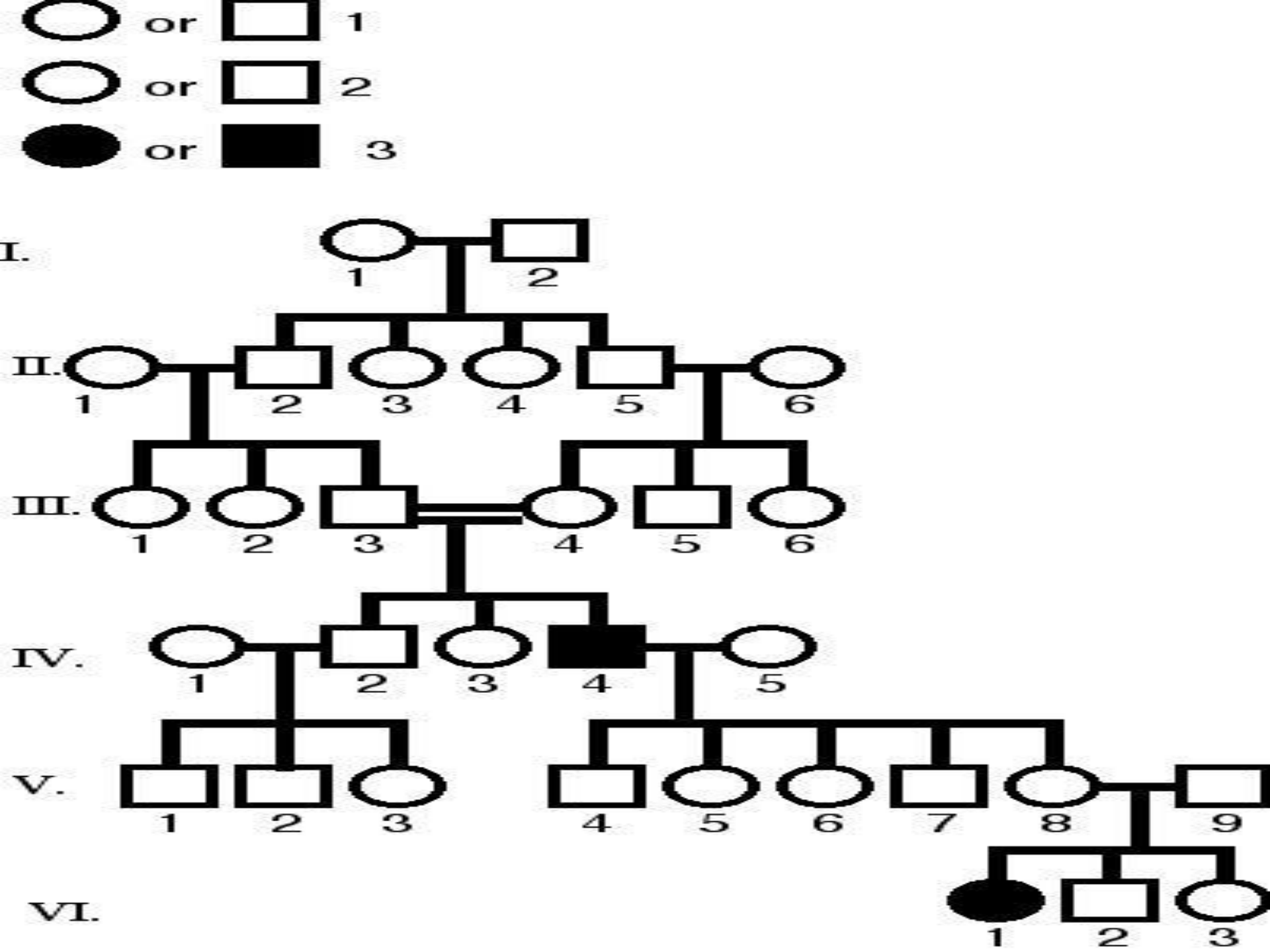
Human Genetics

Pedigrees

- A chart that shows the relationships within a family on how a trait is passed from one generation to the next

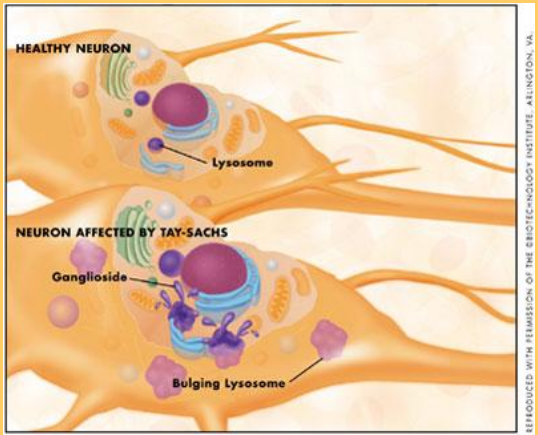

or 1
or 2
or 3
I.
1 2
II.
1 2 3 4 5 6
III.
1 2 3 4 5 6
IV.
1 2 3 4 5
V.
1 2 3 4 5 6 7 8 9
VI.
1 2 3

Human Genes Recessive Disorders:

Affected must be homozygous recessive.

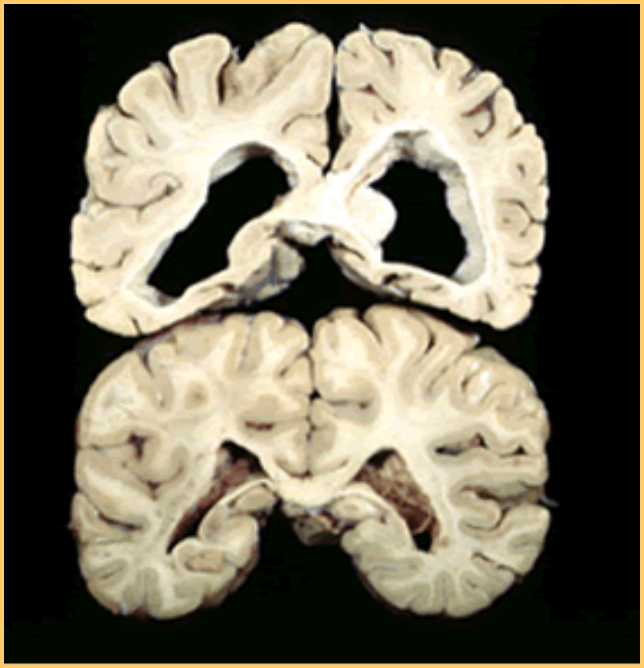
- **Albinism** – no pigment in skin, hair and eyes

- **PKU** – accumulation of phenylalanine in tissues. Mental retardation, abnormal skin pigments
- **Tay-Sachs** – lipid accumulation in brain cells. Early death, retardation



Dominant Disorders: affected individuals only need 1 dominant allele

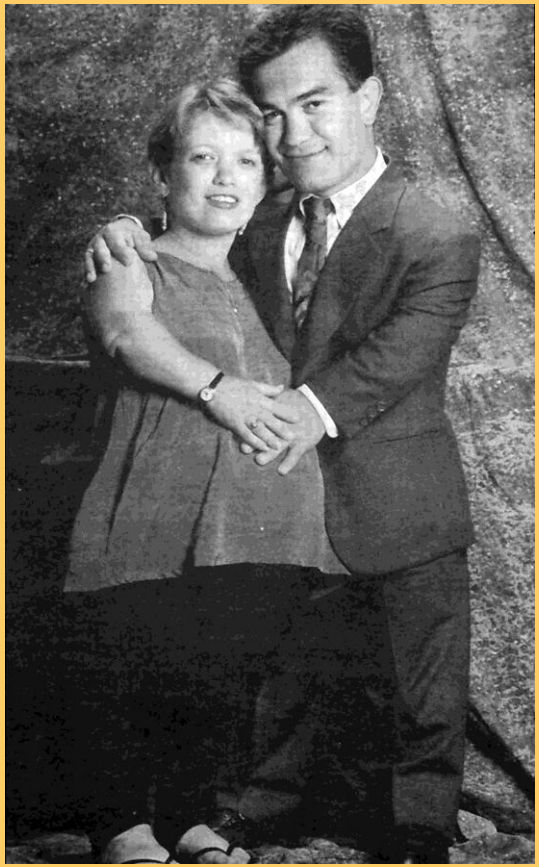
- **Huntington Disease**: People start to show symptoms in their thirties or forties. It causes gradual damage to the nervous system.

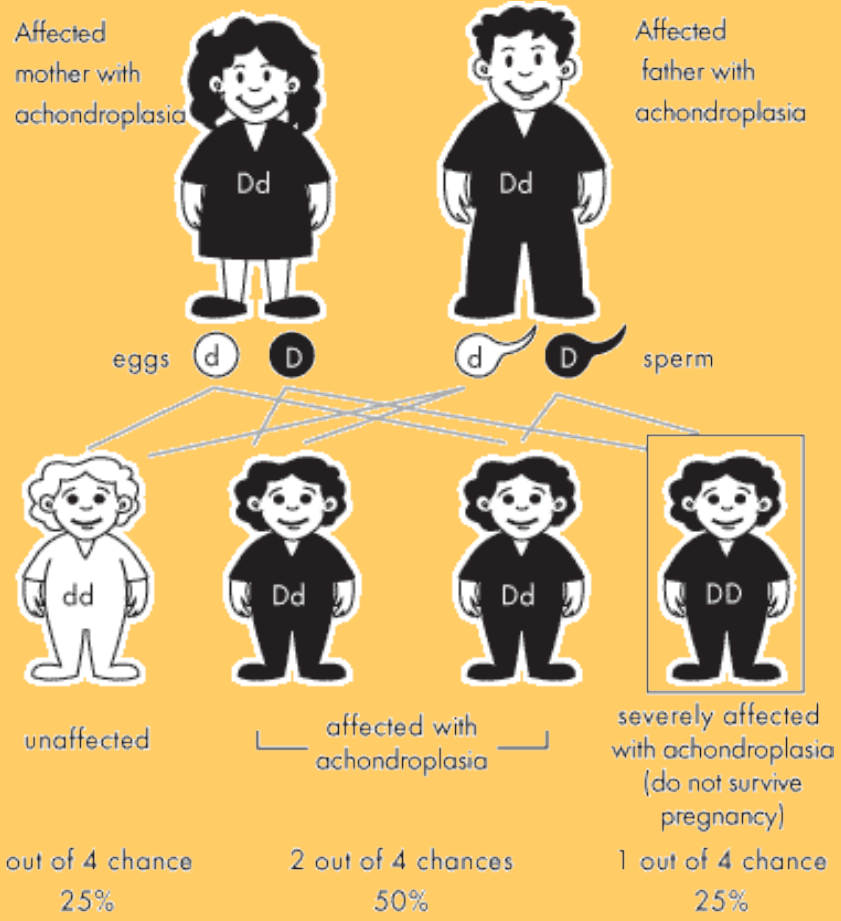


The human brain, showing the impact of HD on brain structure in the basal ganglia region of a person with HD (top) and a normal brain (bottom).

http://kobiljak.msu.edu

- **Achondroplasia** – dwarfism

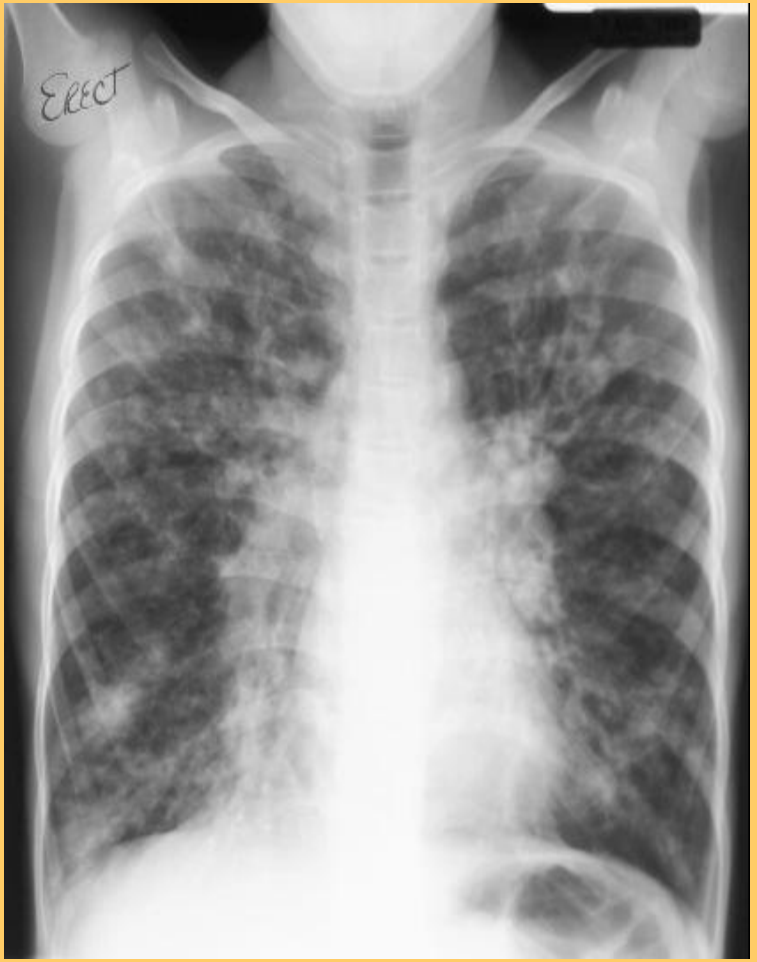




Genes that cause Molecular Change

Cystic Fibrosis (CF)

- accumulation of mucus in lungs



Sickle Cell Anemia

- CODOMINANT: caused by a change in the shape of red blood cells.
- RBC can not travel efficiently throughout the capillaries.
- Stop blood movement through these vessels; damage cells and tissues.

- More common on African descendent people (10% of African American, and as many as 40% of African).
- **Why is this trait so common on those particular populations?**
- People who are carriers for sickle cell are resistant to malaria – better chance of survival!

- Practice Pedigrees
- Video – sickle cell (from VCU)