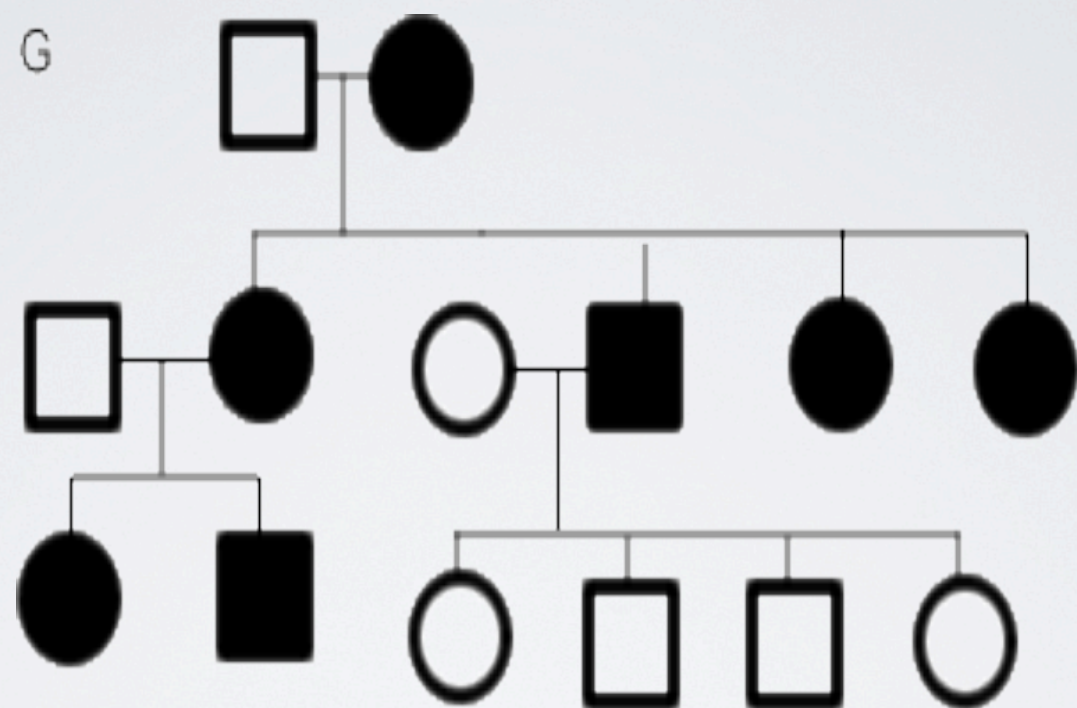


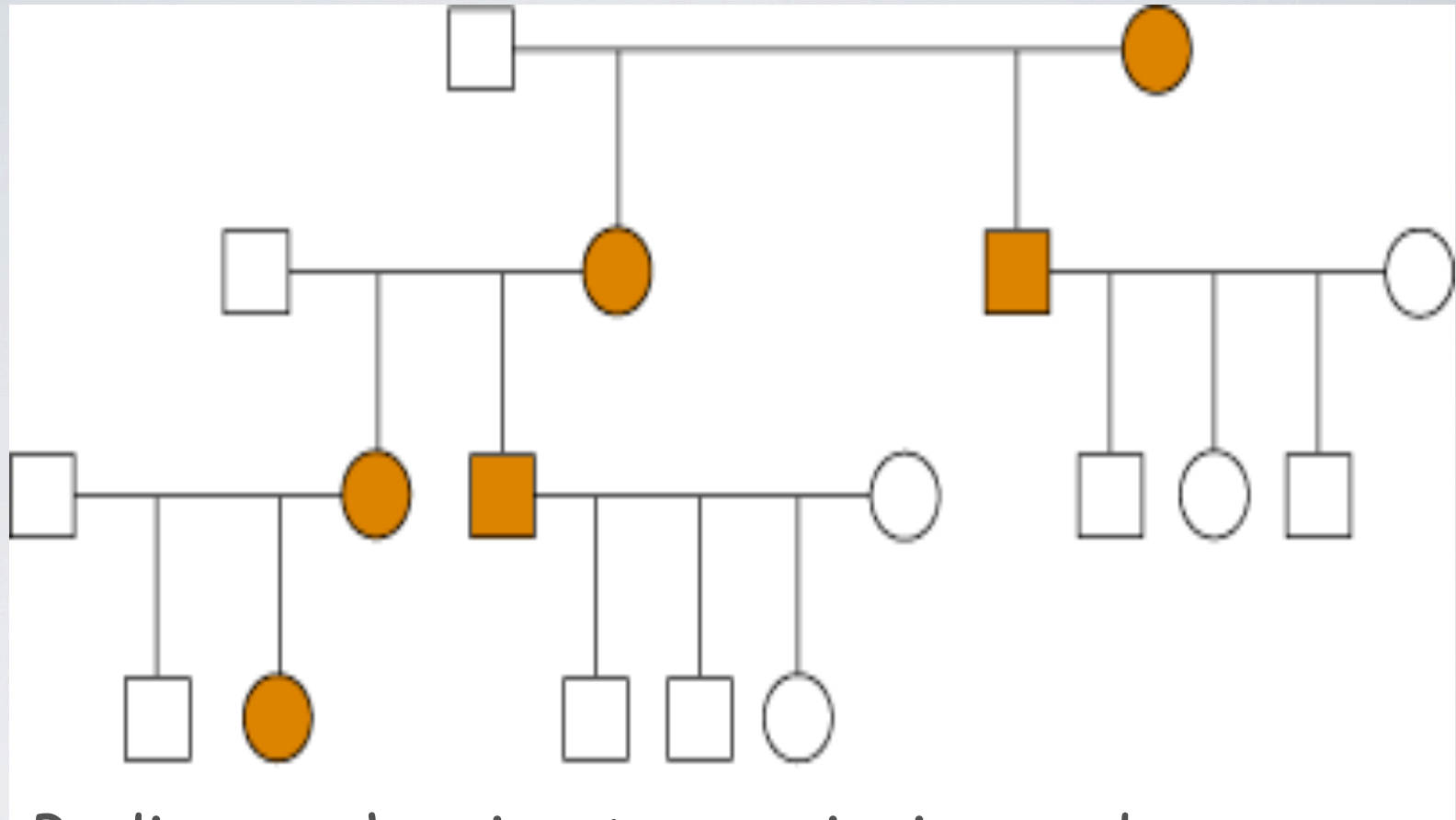
THE STEPS WHEN INTERPRETING A PEDIGREE CHART

- Determine if the pedigree chart shows an autosomal or X-linked disease.
- If most of the males in the pedigree are affected, then the disorder is X-linked
- If it is a 50/50 ratio between men and women the disorder is autosomal.

INTERPRETING A PEDIGREE CHART

- Determine whether the disorder is dominant or recessive.
- If the disorder is dominant, one of the parents must have the disorder.
- If the disorder is recessive, neither parent has to have the disorder because they can be heterozygous.





Pedigree showing transmission and expression of a mitochondrial trait. Note that transmission occurs only through females.

Rules of Inheritance

Autosomal Recessive

- Appears in both sexes with equal frequency
- Trait tend to skip generations
- Affected offspring are usually born to unaffected parents
- When both parents are hetrozygout, approx. $1/4$ of the progeny will be affected
- Appears more frequently among the children of consanguine marriages

Rules of Inheritance

Autosomal Dominant

- Appears in both sexes with equal frequency
- Both sexes transmit the trait to their offspring
- Does not skip generations
- Affected offspring must have an affected parent unless they possess a new mutation
- When one parent is affected (het.) and the other parent is unaffected, approx. 1/2 of the offspring will be affected
- Unaffected parents do not transmit the trait

Rules of Inheritance

X-Linked Dominant

- Both males and females are affected; often more females than males are affected
- Does not skip generations.
 - Affected sons must have an affected mother;
 - affected daughters must have either an affected mother or an affected father
- Affected fathers will pass the trait on to all their daughters
- Affected mothers if heterozygous will pass the trait on to $1/2$ of their sons and $1/2$ of their daughters

Rules of Inheritance

X-Linked Recessive

- More males than females are affected
- Affected sons are usually born to unaffected mothers, thus the trait skips generations
- Approximately $1/2$ of carrier mothers' sons are affected
- It is never passed from father to son
- All daughters of affected fathers are carriers

Rules of Inheritance

Y-Linked Dominant

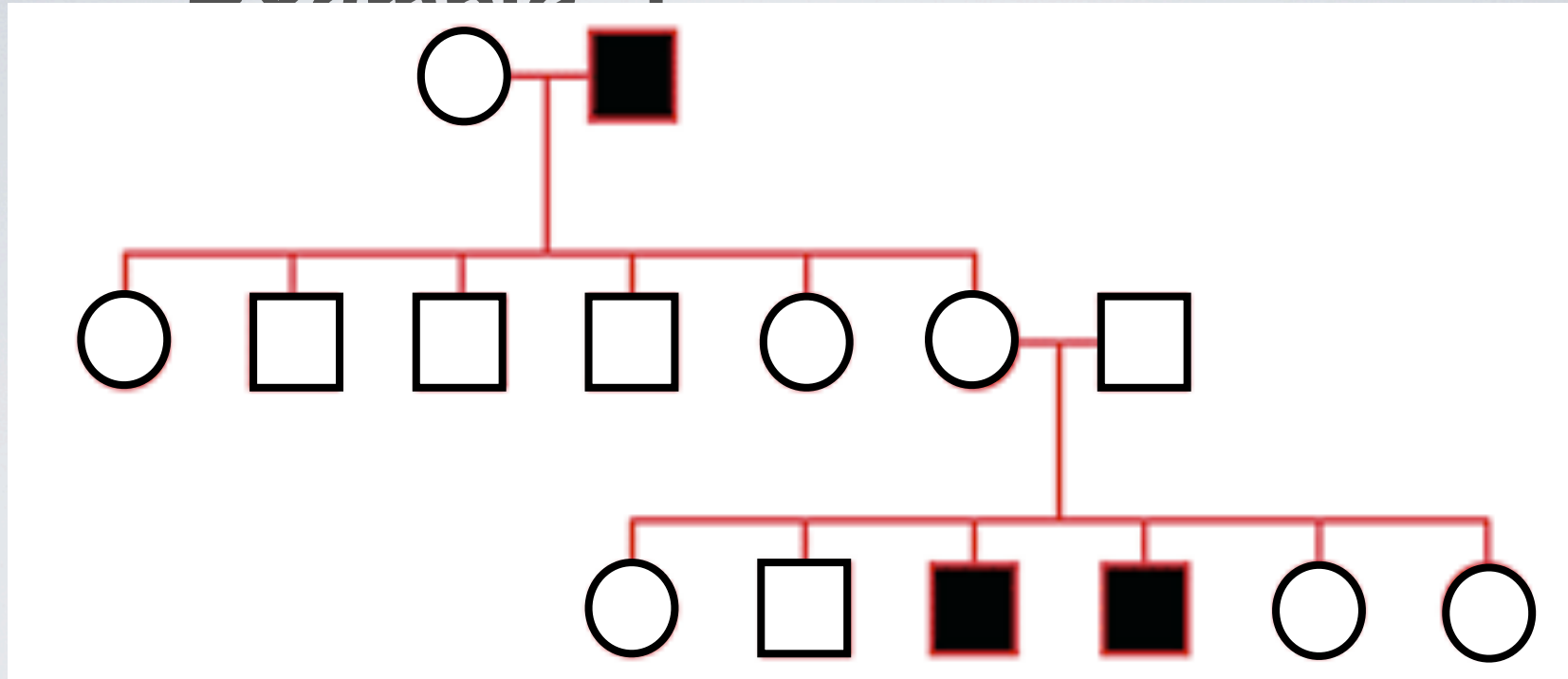
- Only males are affected
- It is passed from father to all sons
- It does not skip generations

Mitochondrial

- Trait is inherited from mother only
- All children of a mother are at risk to be affected or carriers

Example

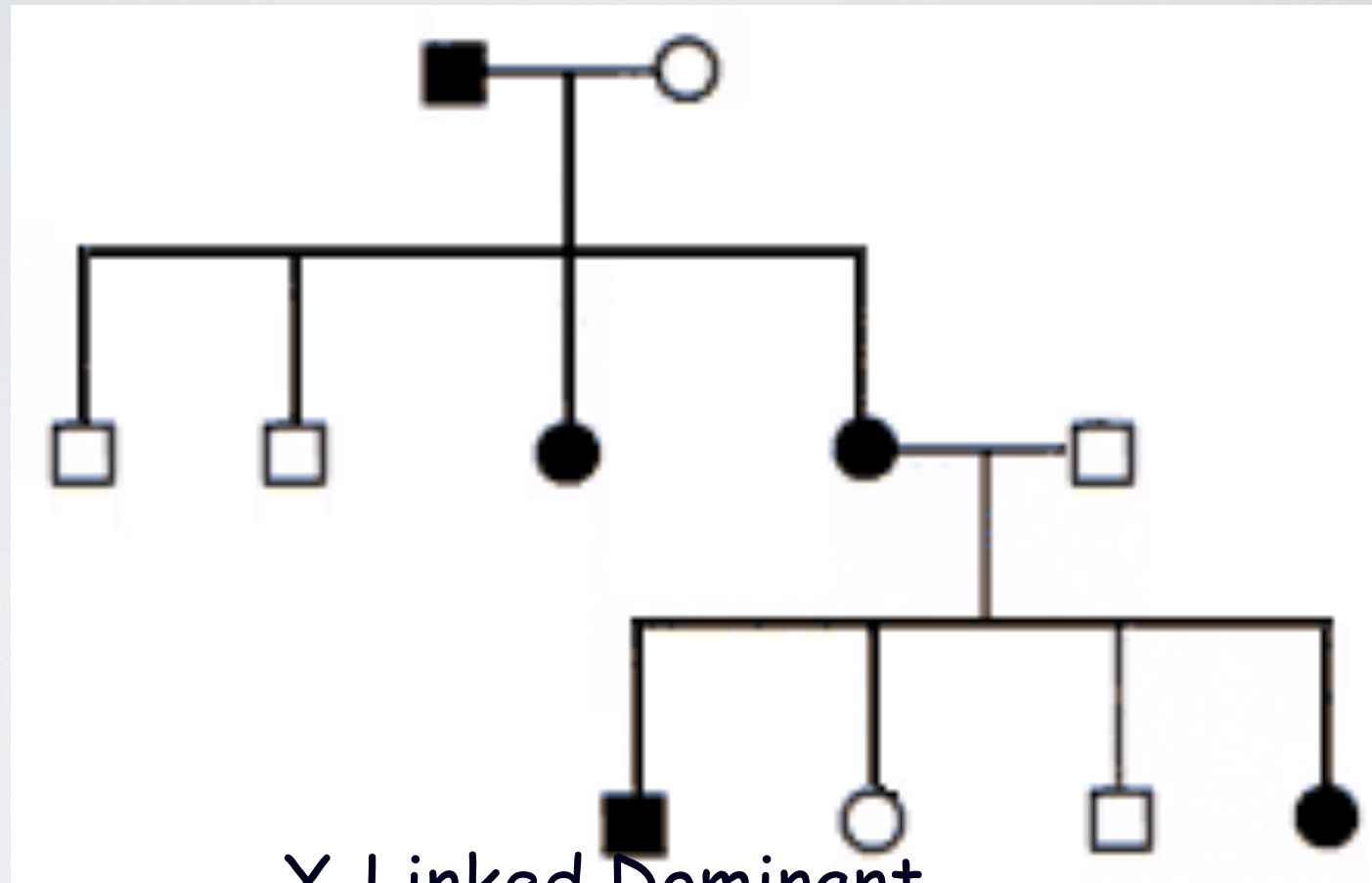
Example 1



X-linked recessive Hemophilia

Only males are affected and sons do not share the phenotype of their father - Thus X-linked
Expression of hemophilia skips generations:
RECESSIVE

Example 2

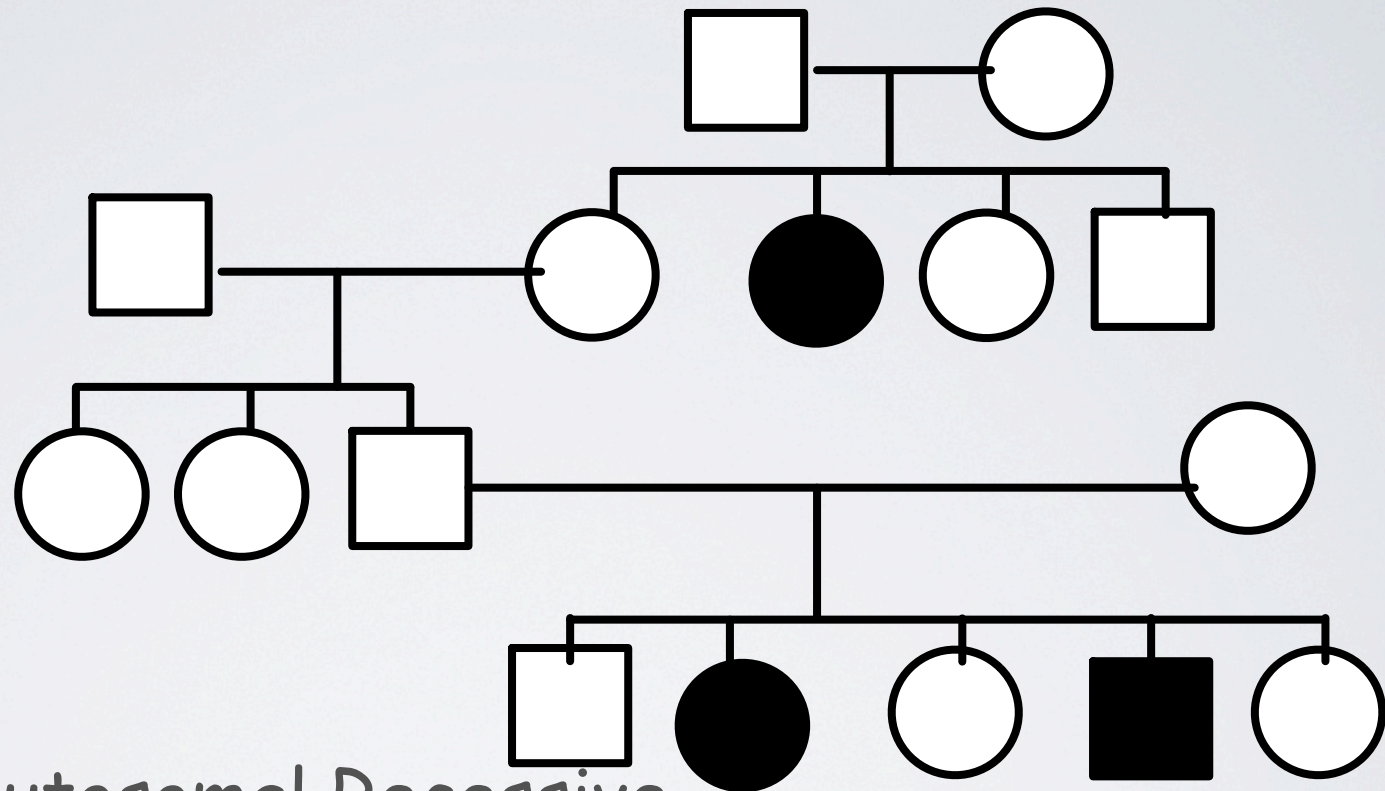


X-Linked Dominant

Every Generation: Dominant

Father passes on to only daughters

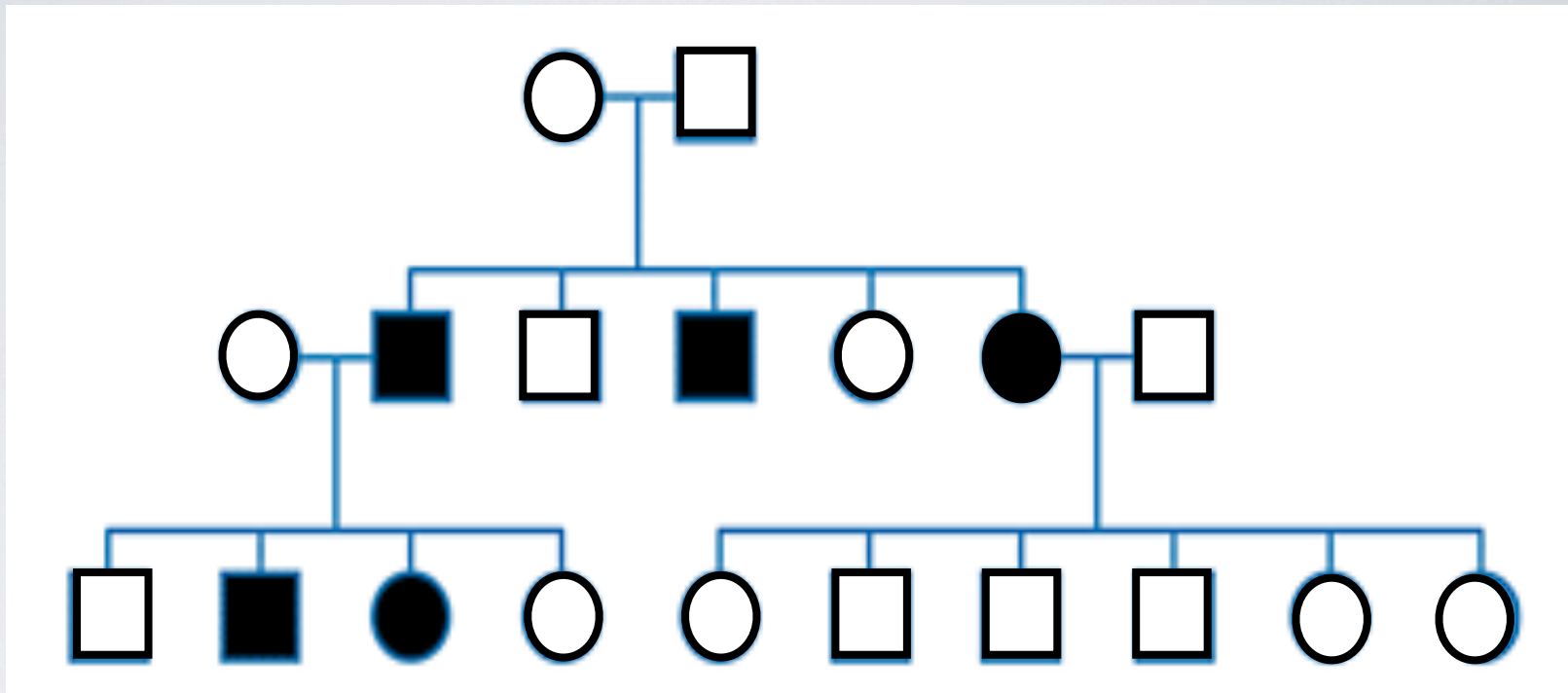
Example 3



Autosomal Recessive

Affected individual from
unaffected parents

Example 4

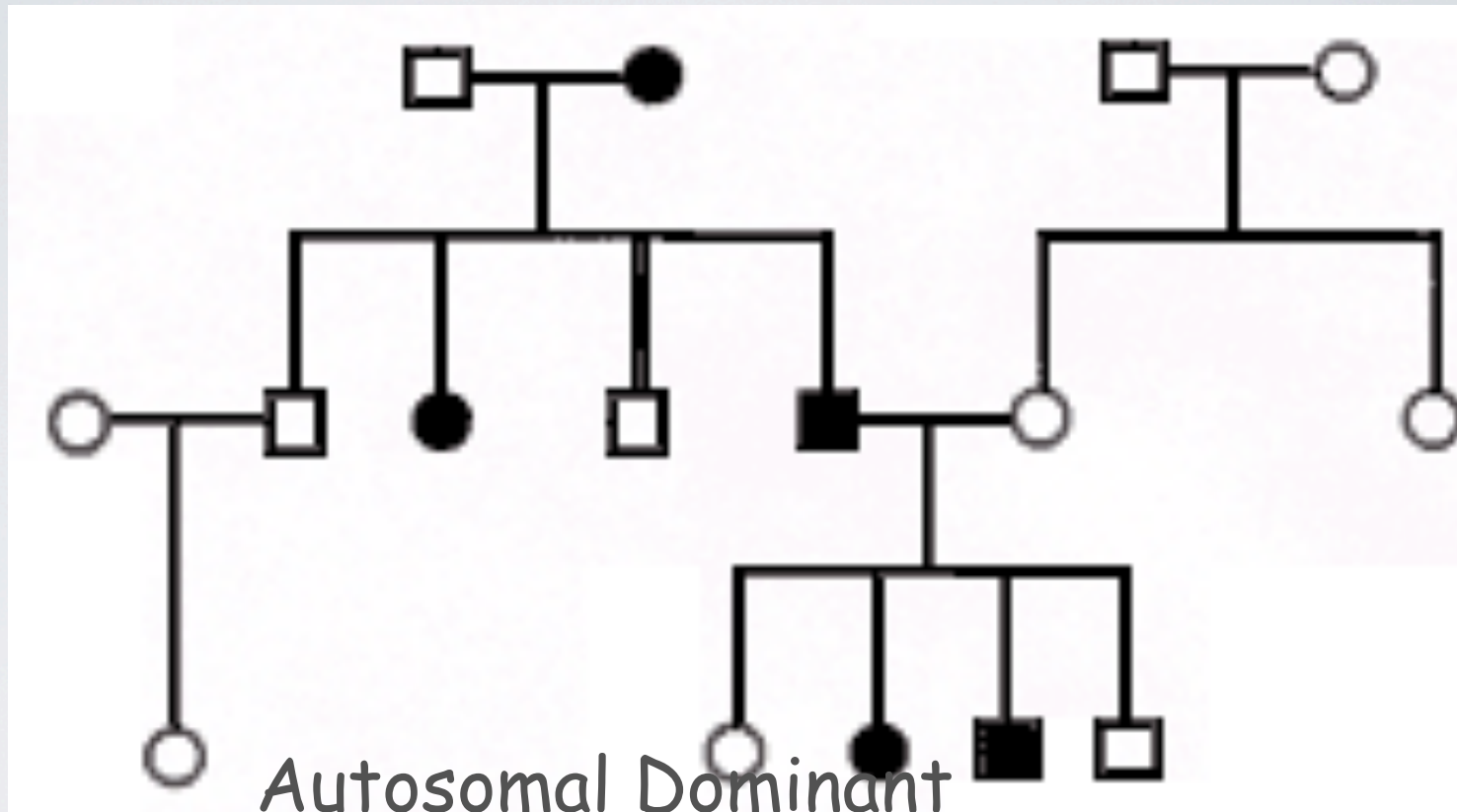


Autosomal recessive

Expressed in both sexes at approximately
equal frequency: AUTOSOMAL

Not expressed Autosomal Recessive in every

Example 5



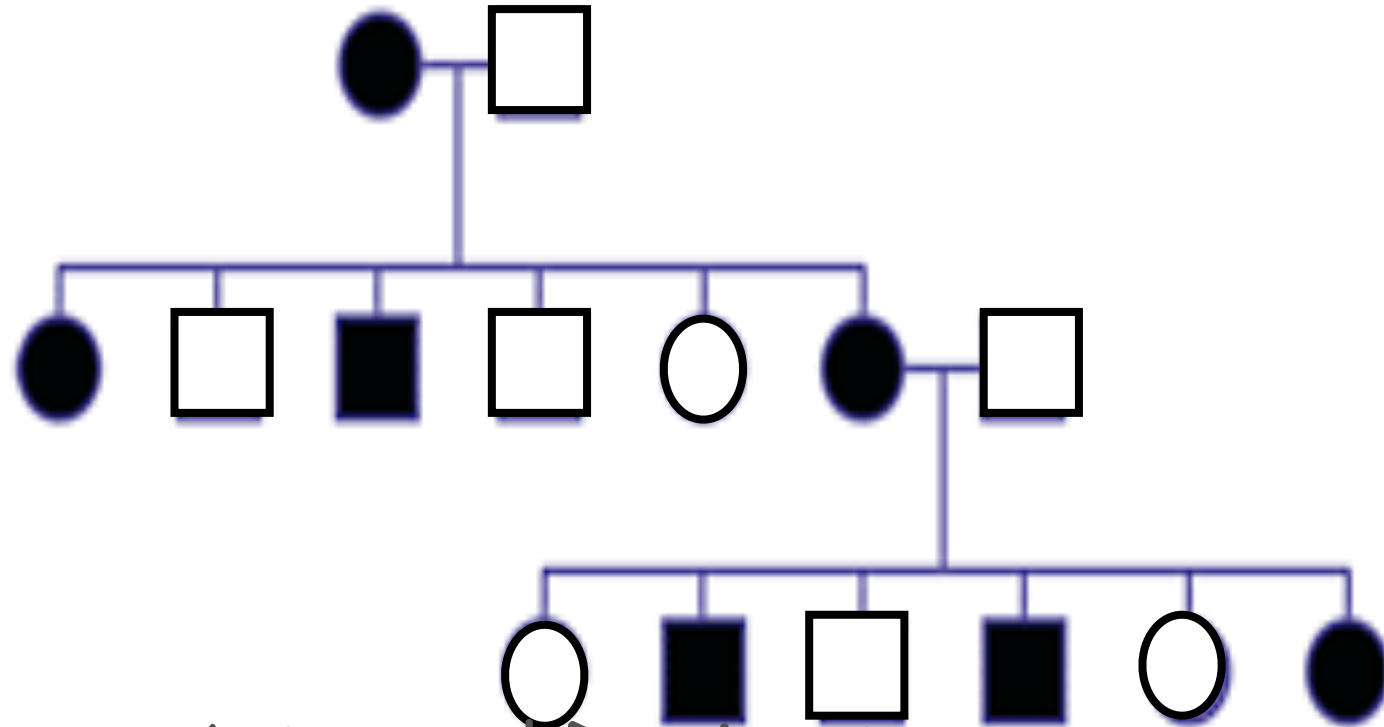
Autosomal Dominant

In every generation:

DOMINANT

Equal in Males and Females:

Example 6

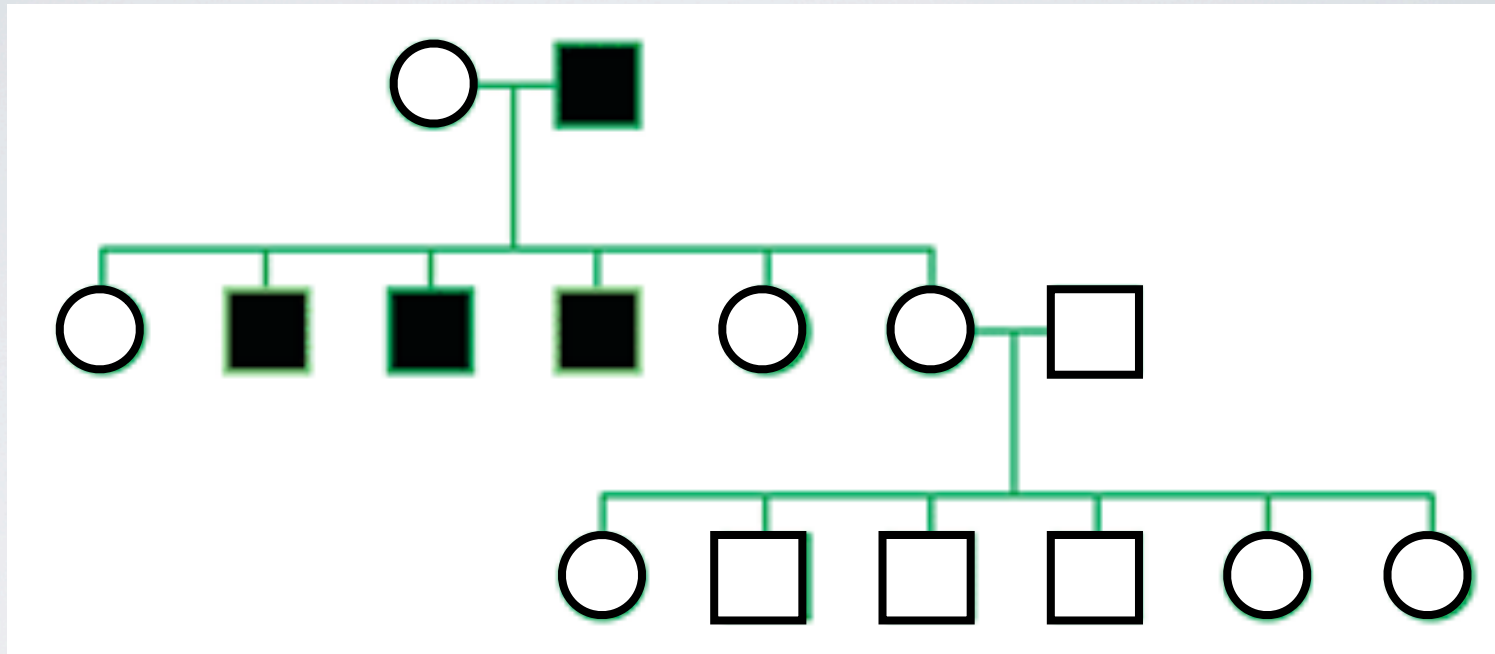


Autosomal Dominant

Appears equally In both sexes
so autosomal

In every generation so

Example 7

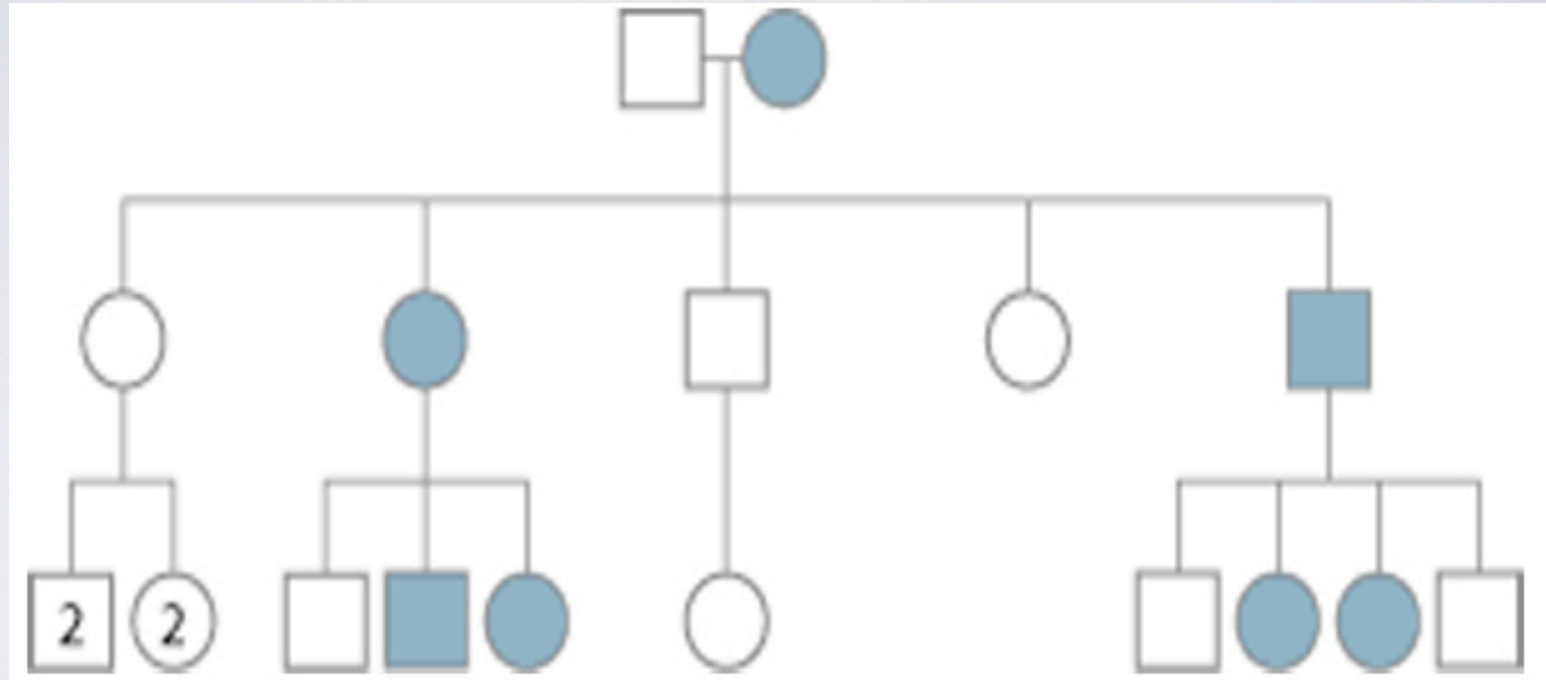


Y-Linked

Only males are affected

All sons of affected
father

Example 8



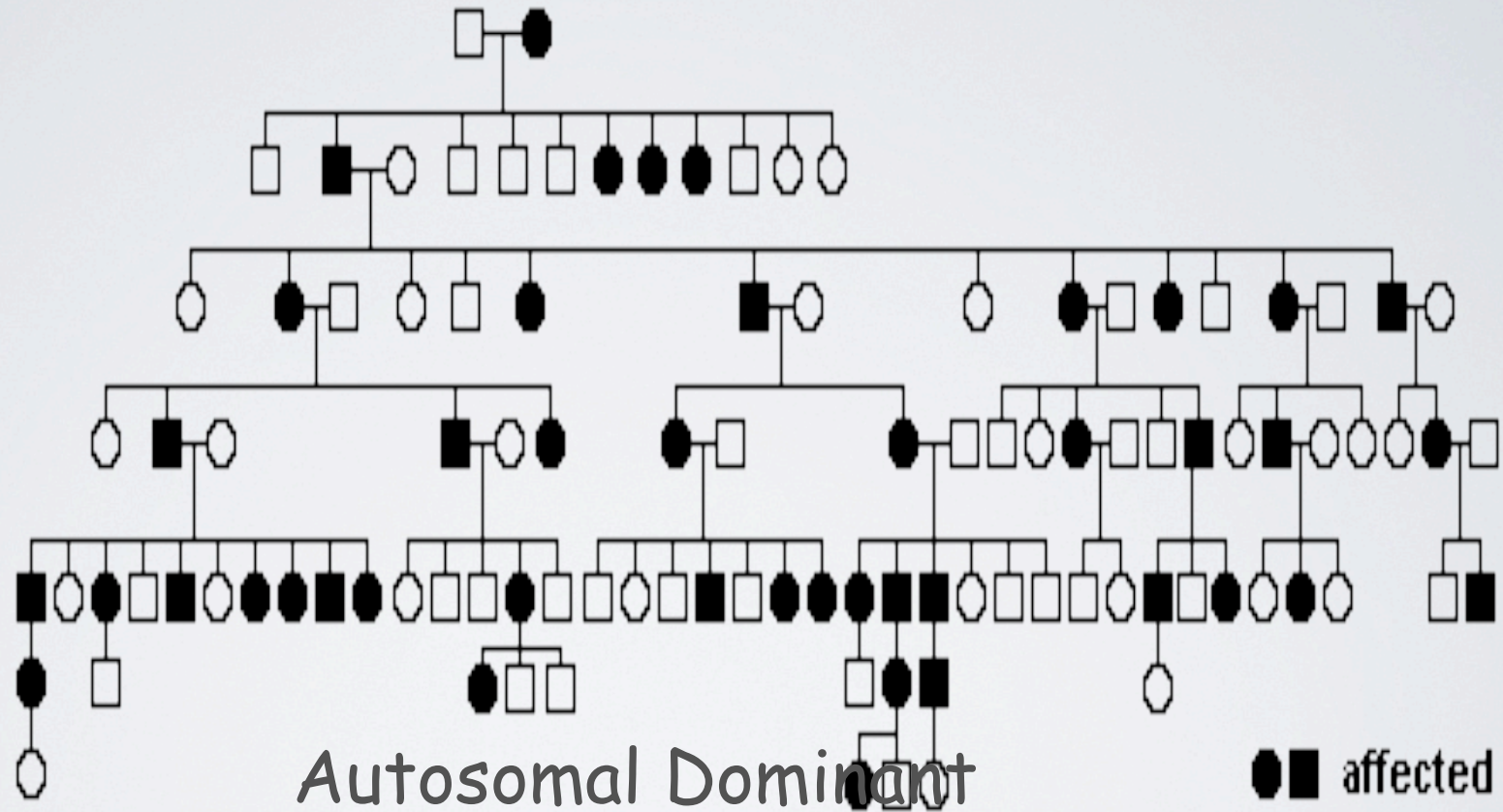
X-Linked Dominant

Every generation: DOMINANT

Daughters of affected males are affected

Half offspring from mothers should get it

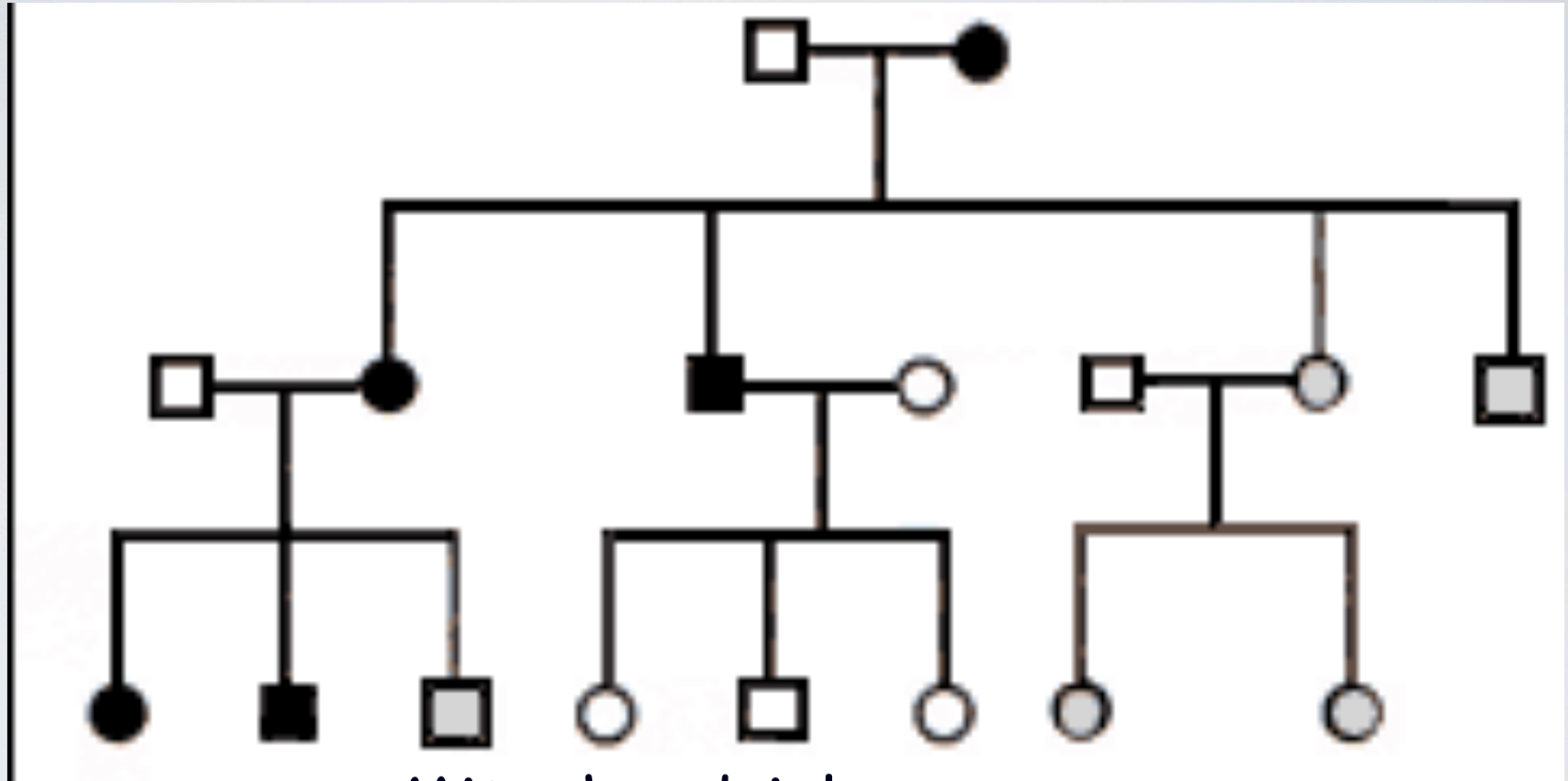
Example 9



In every generation: DOMINANT

Both Male and female affected:

Example 10

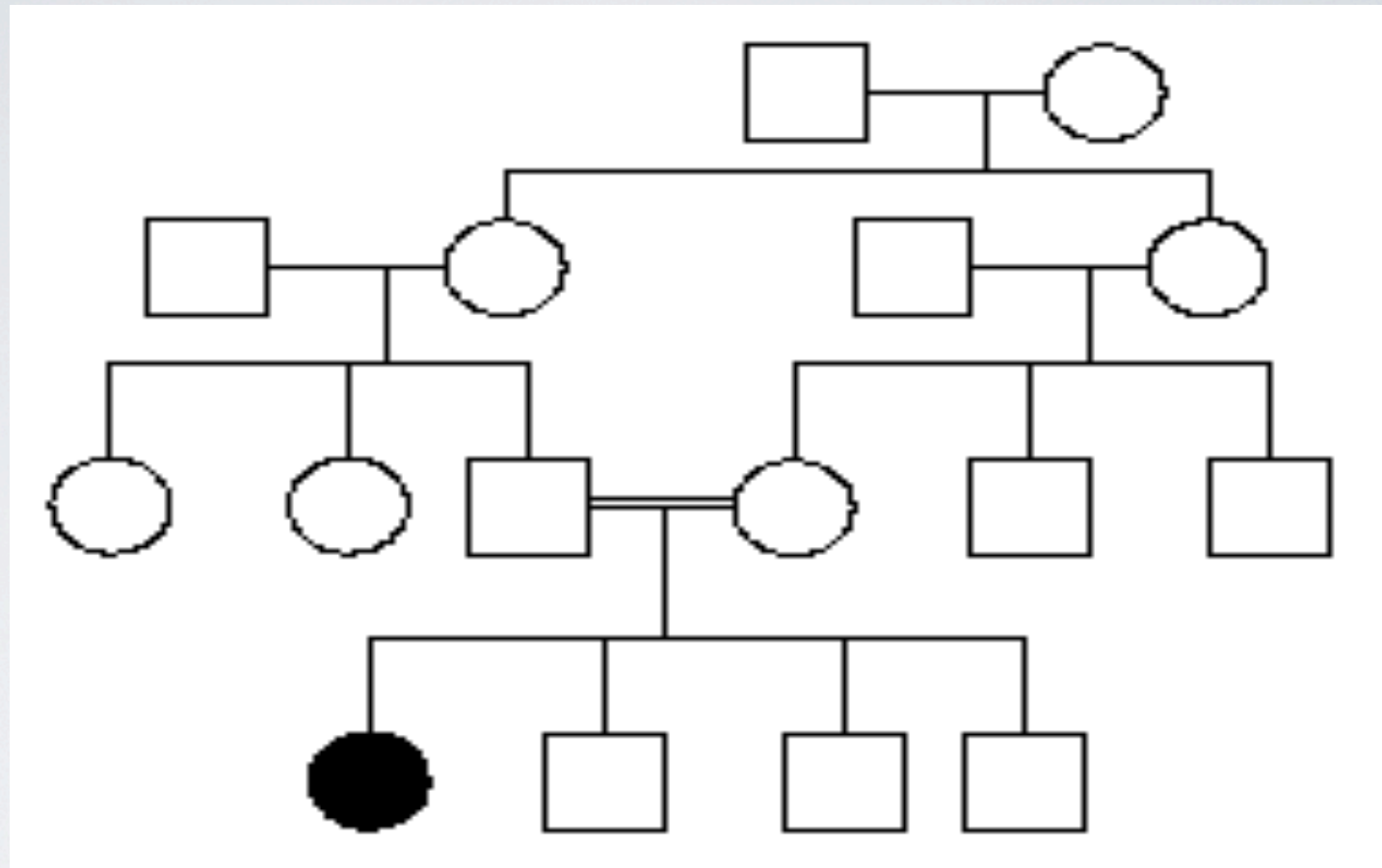


Mitochondrial

All children at risk

Father doesn't pass it along to

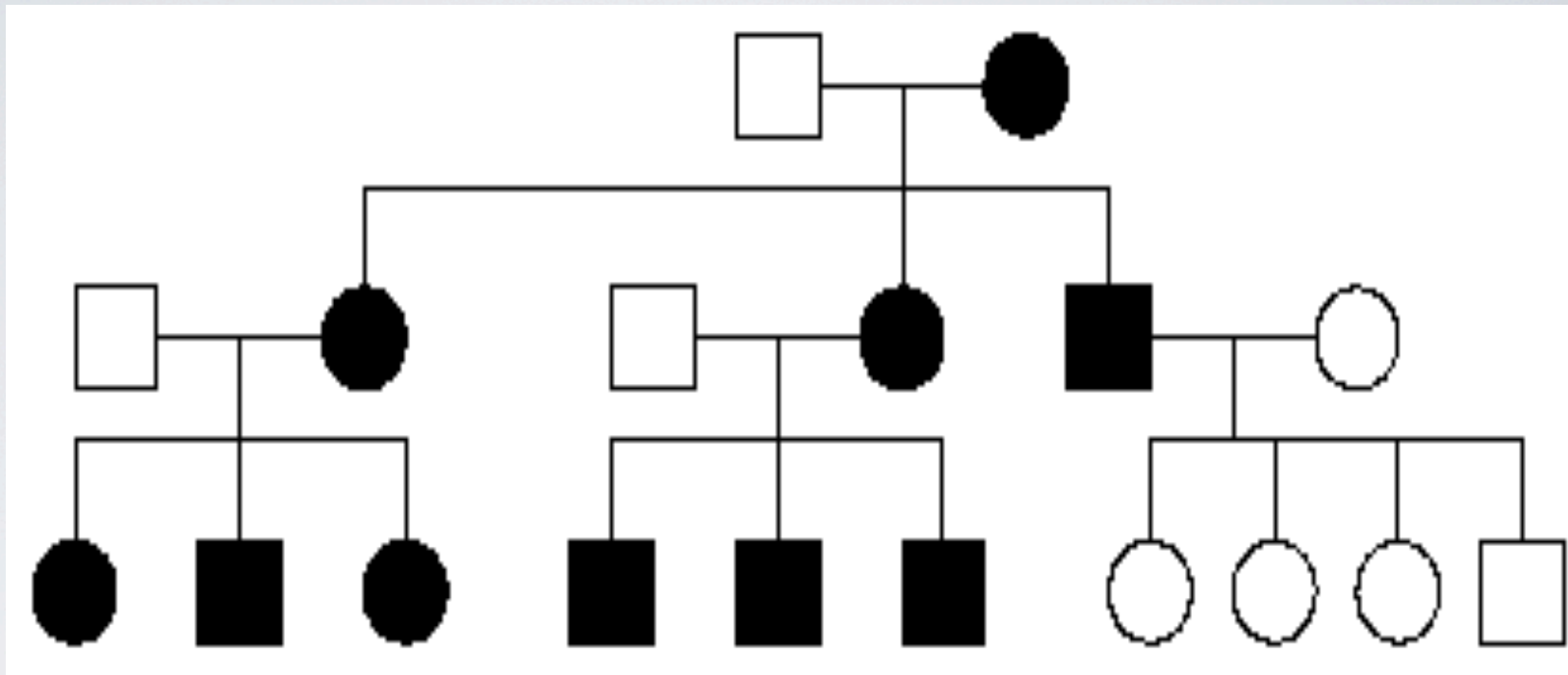
Example 11



Autosomal
Recessive

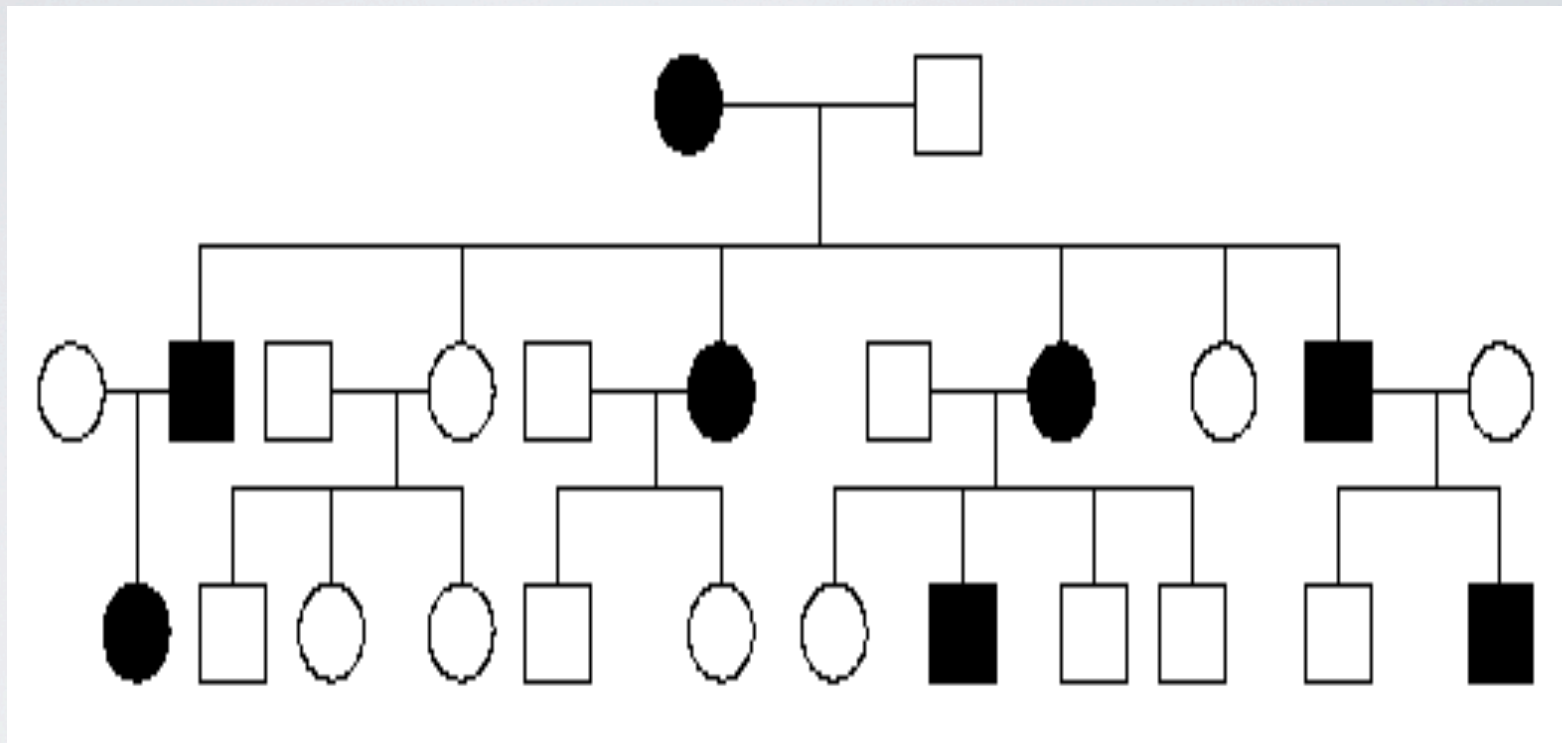
Consanguinity

Example 12



Mitochondrial
Inheritance

Example 13

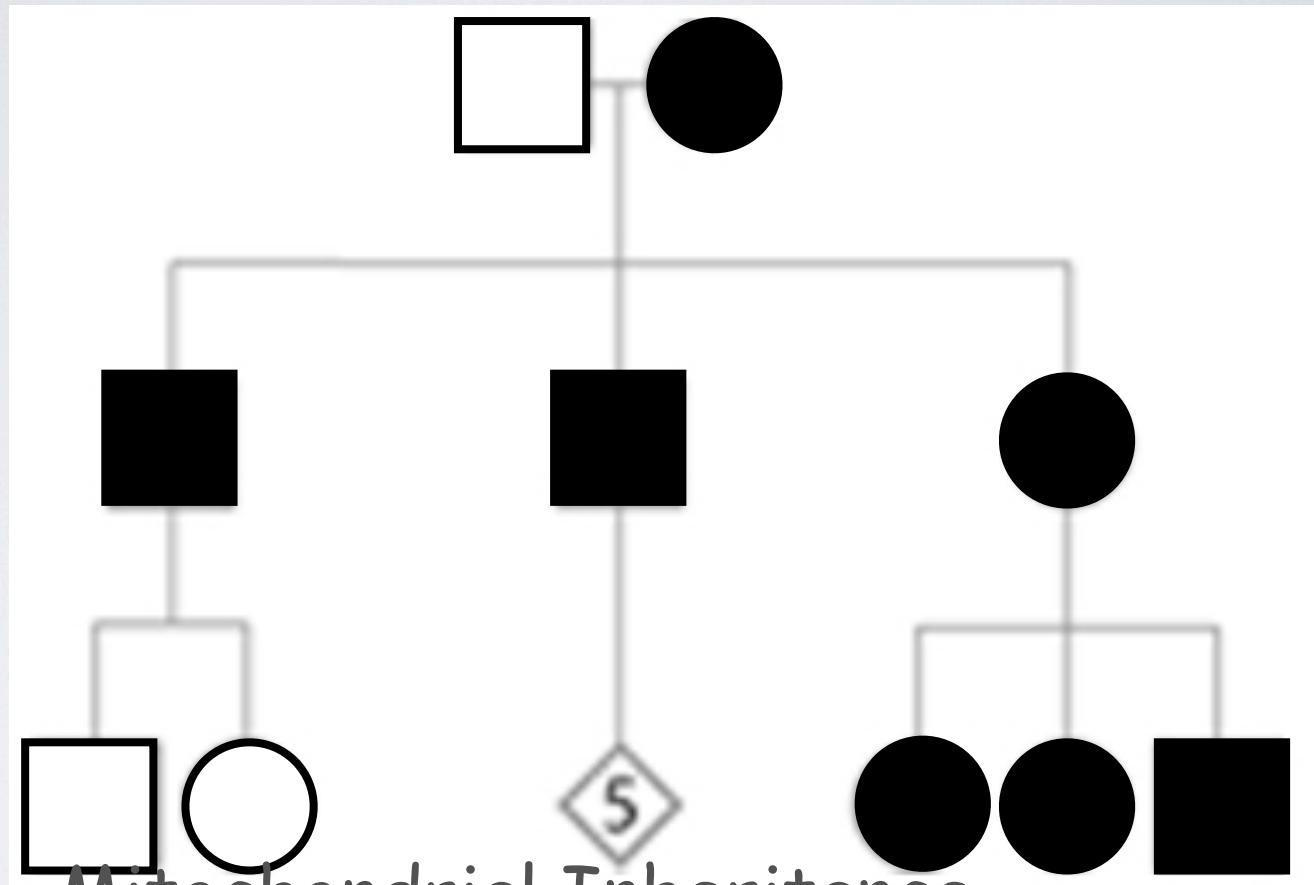


Autosomal dominant

In every generation: DOMINANT

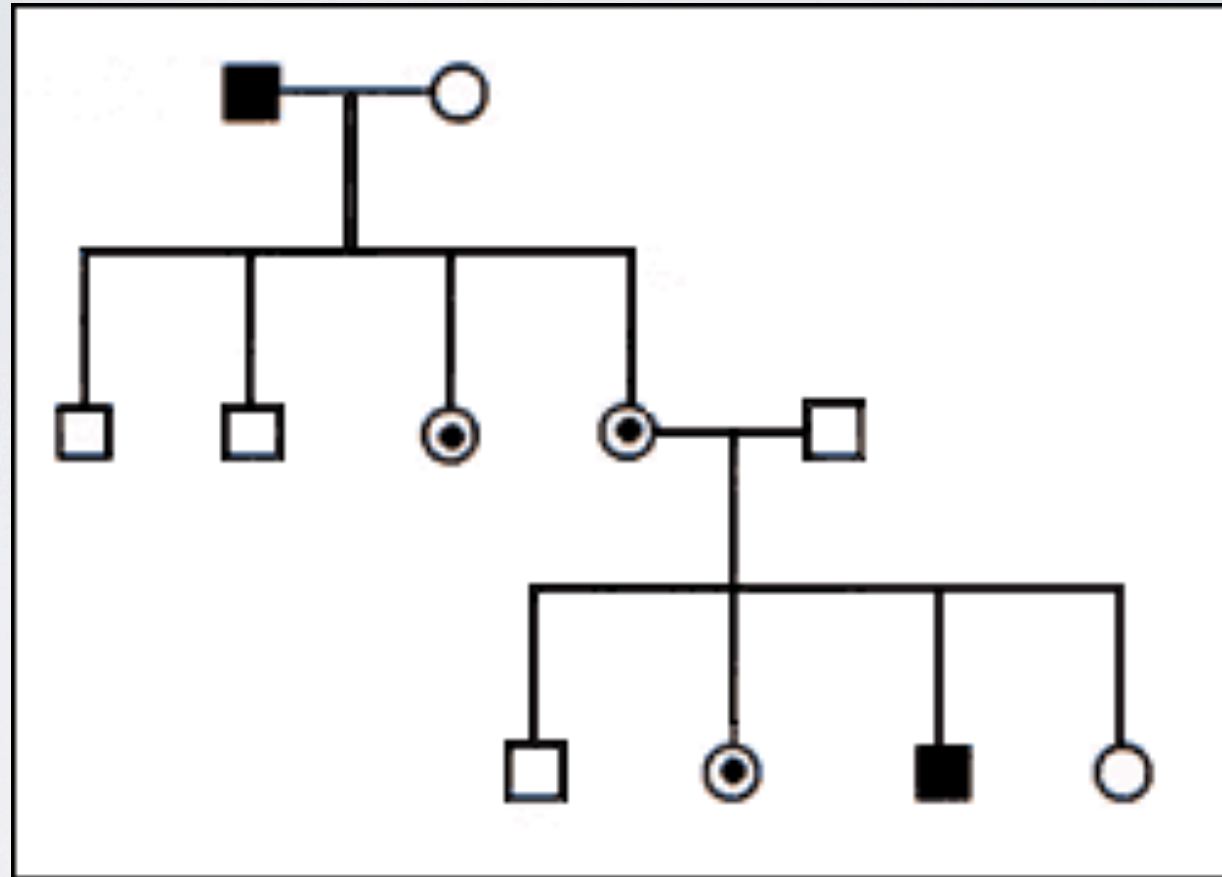
In males and females: Autosomal

Example 14



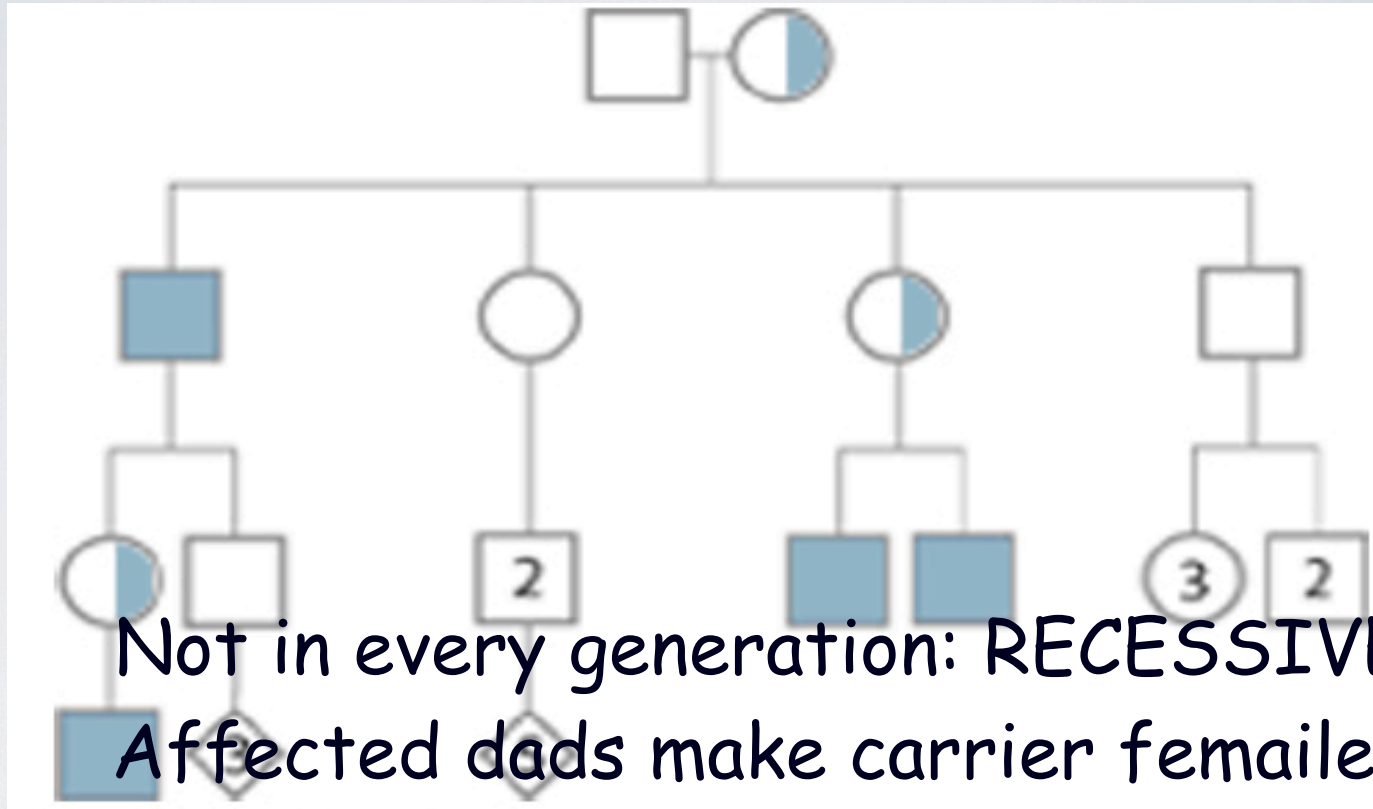
Mitochondrial Inheritance
Fathers don't transmit, just
mothers

Example 15



X-linked
Recessive

Example 16



Not in every generation: RECESSIVE

Affected dads make carrier females

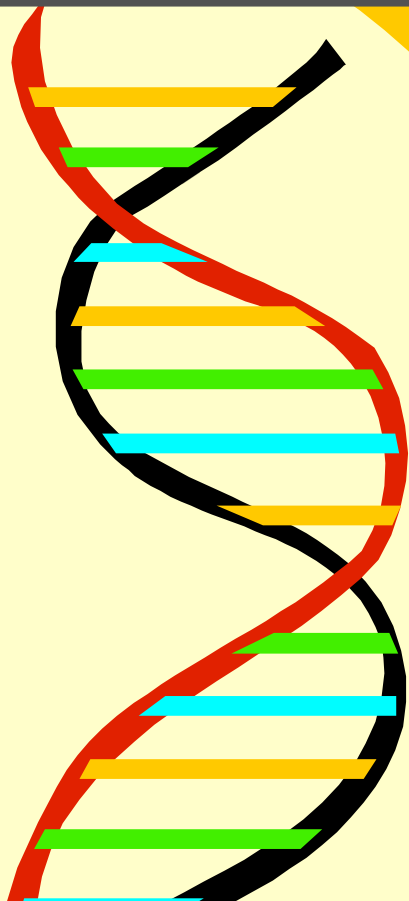
Transmitted through mother

Only males are affected and sons do not
share the phenotype of their father - Thus
X-linked

The End



Answers:



- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15
- 16

X-Linked Recessive
X-Linked Dominant
Autosomal Recessive
Autosomal Recessive
Autosomal Dominant
Autosomal Dominant
Y-Linked
X-Linked Dominant
Autosomal Dominant
Mitochondrial
Autosomal Recessive
Mitochondrial
Autosomal Dominant
Mitochondrial
X-Linked Recessive
X-Linked Recessive

