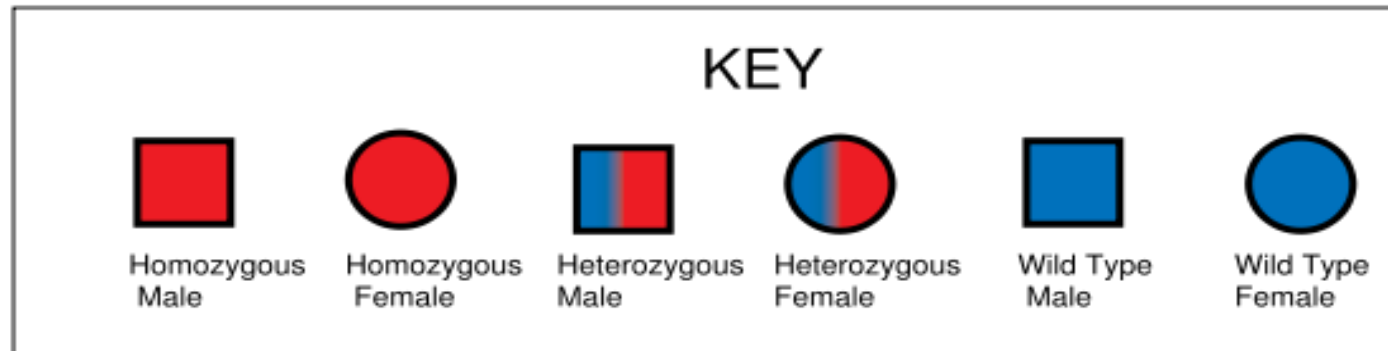
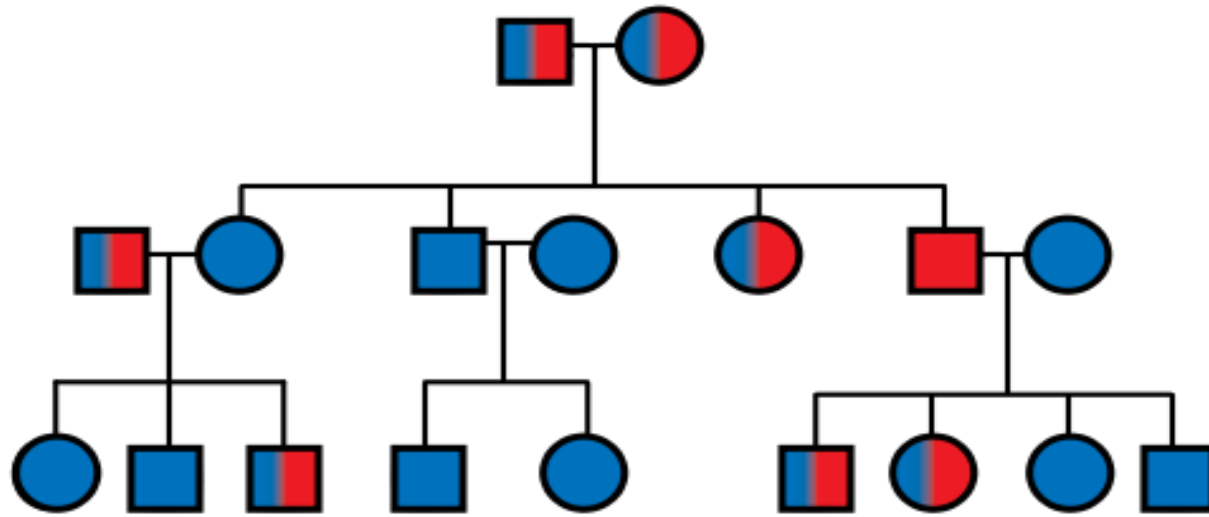


Pedigree Charts



What is a pedigree?

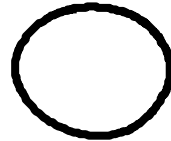
- a chart of the genetic history of a family over several generations
- A genetic counselor may find out about your family history and create a pedigree to keep track of relationships and traits

Constructing a Pedigree

• Normal Male-



• Normal Female-



• Affected Male-



• Affected Female-



Constructing a Pedigree

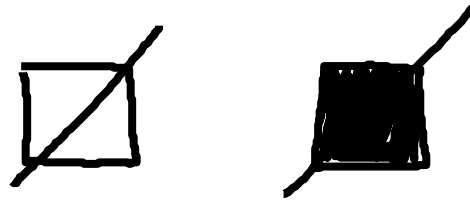
- Male carrier-



- Female carrier-



- Dead male-



- Dead female-

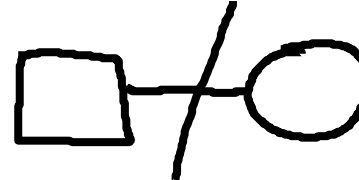


Constructing a Pedigree

• Sex unspecified- 

• Marriage- 

• Extramarital mating- 

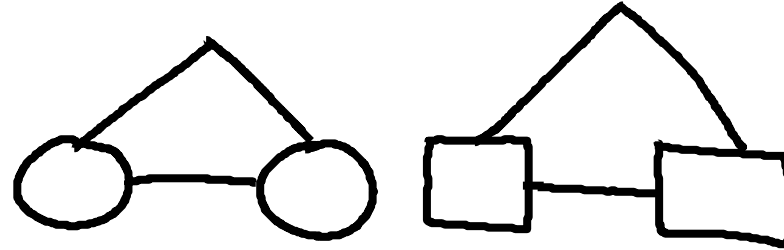
• Divorce- 

Constructing a Pedigree

- Consanguineous mating-



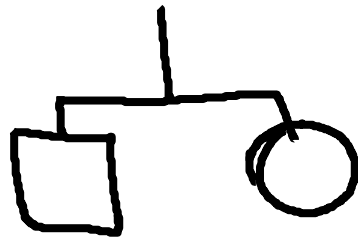
- Monozygotic twins-
(Identical)



- Dizygotic twins-
(Fraternal)

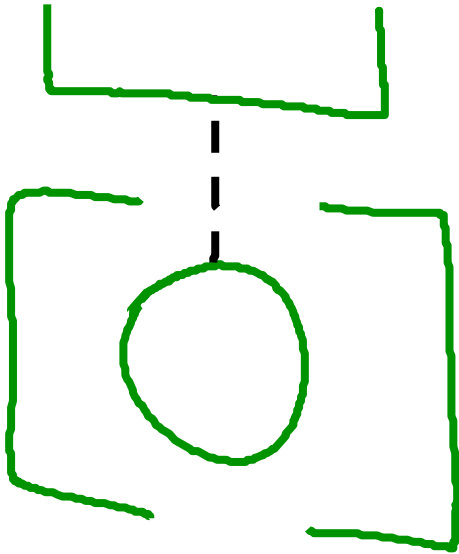


- Siblings-

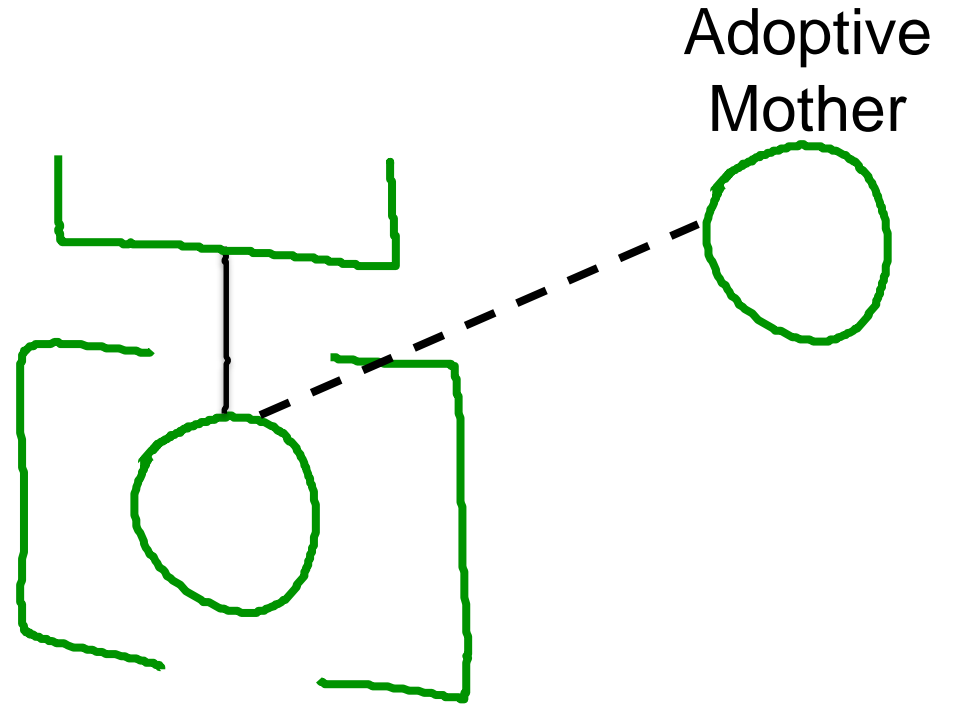


Constructing a Pedigree

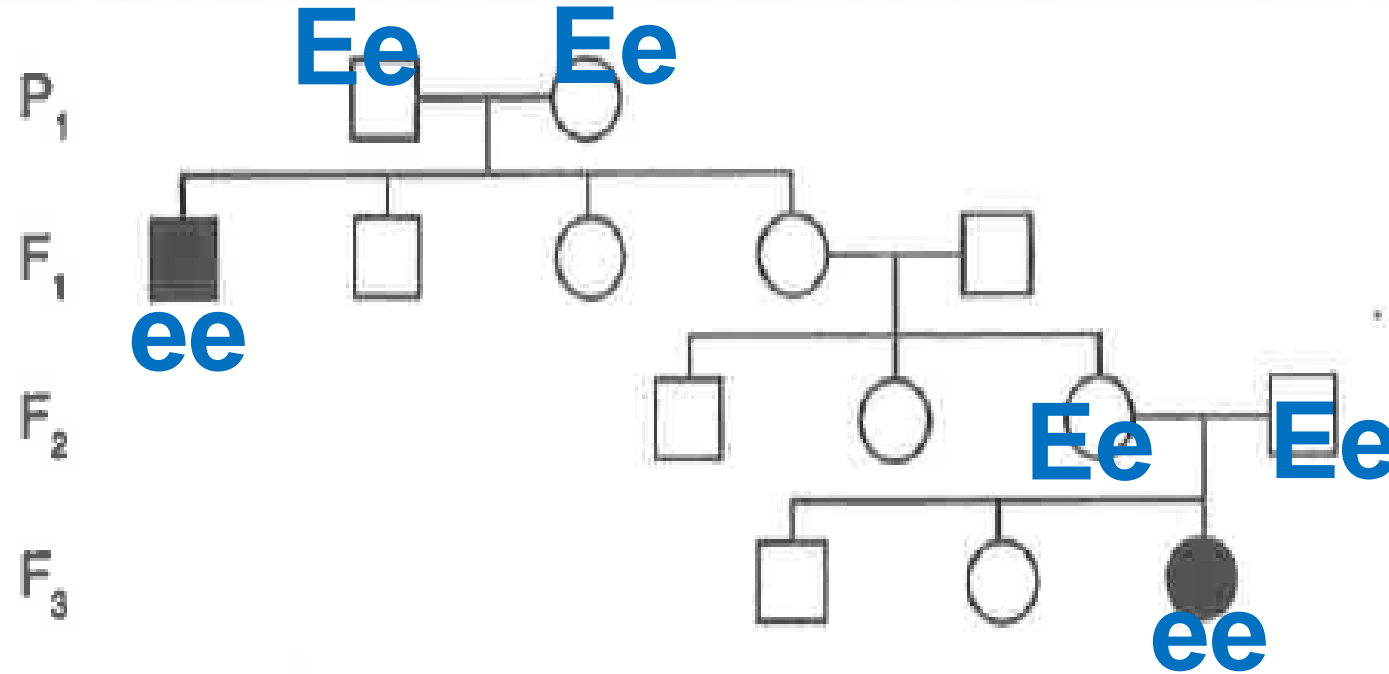
- Adoption in



- Adoption out



The pedigree shows the inheritance of attached earlobes for four generations.



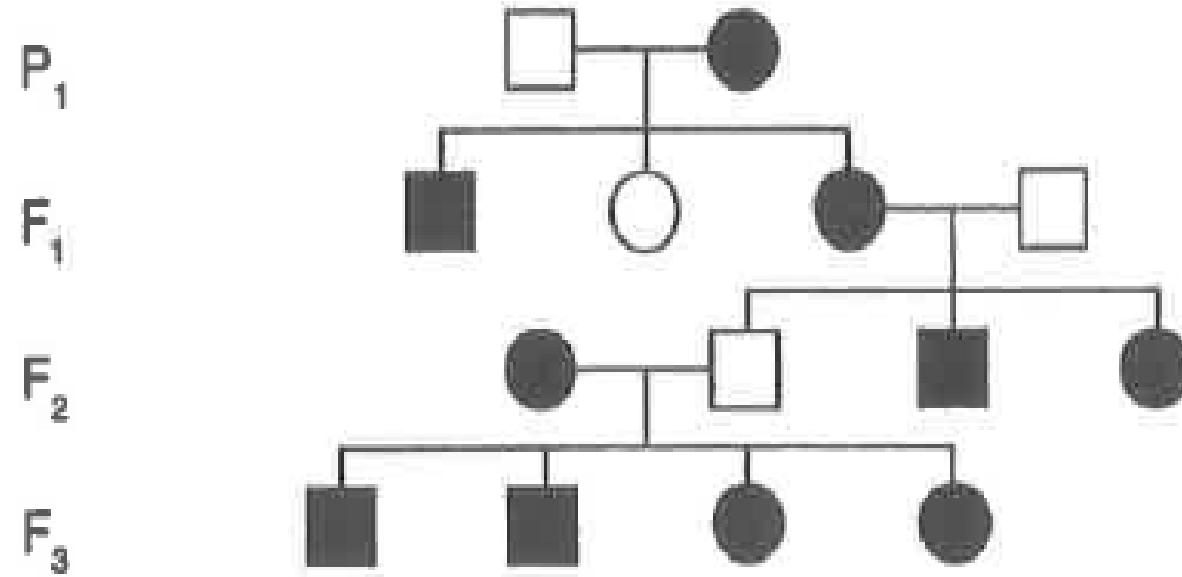
Is the trait for attached earlobes, versus free earlobes, dominant or recessive?

recessive

How do you know? _____

If it were dominant then at least 1 parent of a child who has the trait would also have the trait

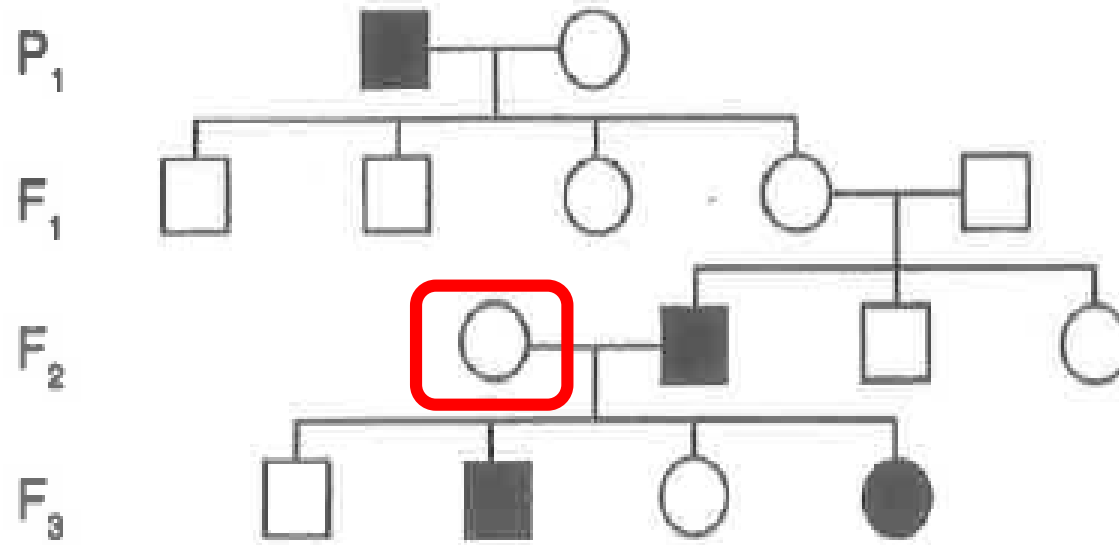
The pedigree shows the inheritance of tongue rolling.



Is this trait dominant or recessive? dominant Explain. _____

All affected individuals have parents that are also affected.

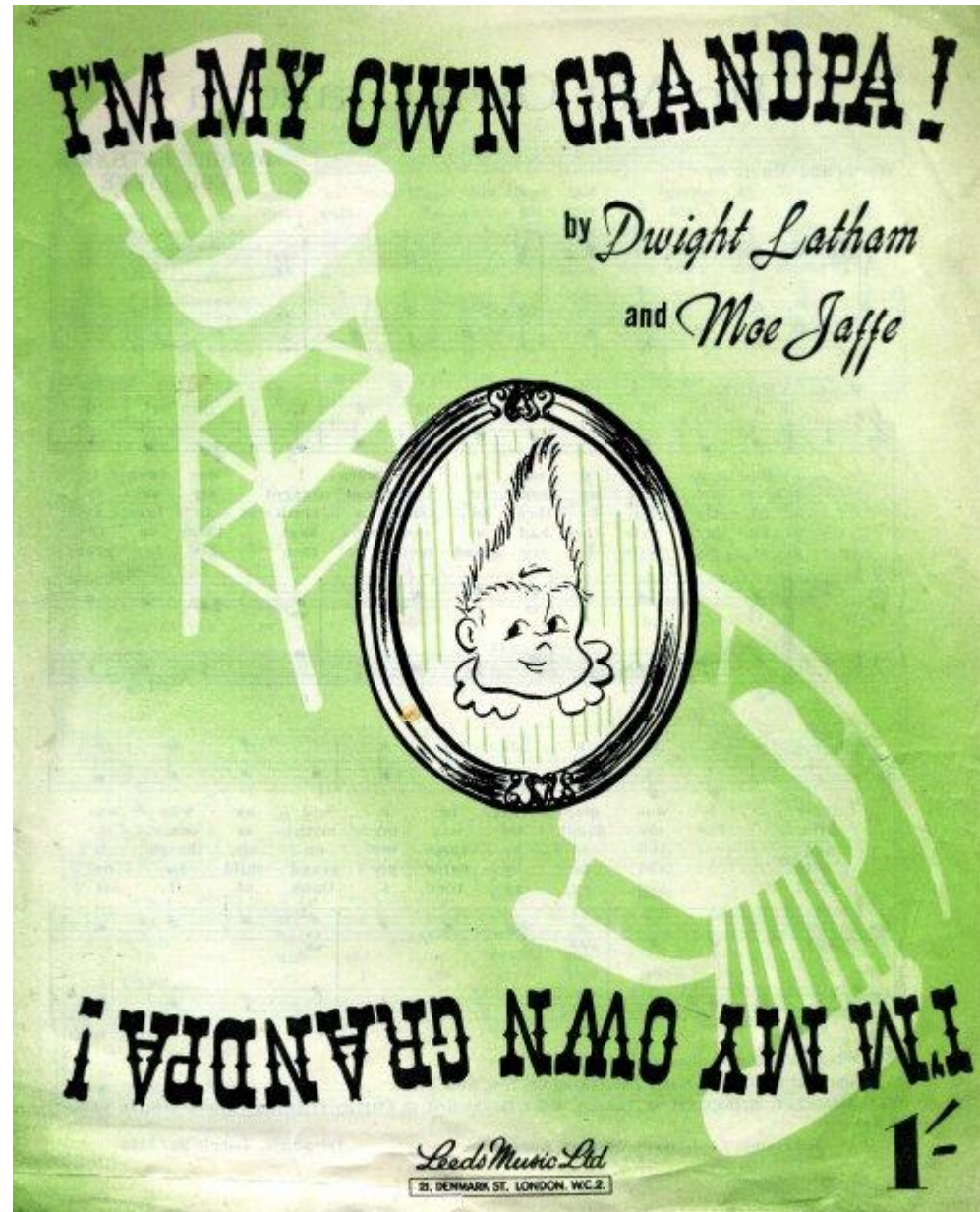
This pedigree shows the inheritance of **colorblindness, a sex-linked trait.**



Is this trait dominant or recessive? **recessive** (F₂ male has it but not his parents)
Is the mother of the colorblind girl in the F₃ generation colorblind, a carrier, or a person with normal color vision?

She must be a carrier for colorblindness (heterozygous) b/c daughter had to inherit 2 recessive alleles to expresses the trait

The Ultimate Pedigree Challenge!



[Song - Ray Stevens- I'm my Own Grandpa](#)

Many years ago when I was twenty-three
I was married to a widow who was pretty as could be.
This widow had a grown-up daughter
Who had hair of red
My father fell in love with her and soon the two were wed.
This made my dad my son-in-law and changed my very life
For my daughter was my mother, 'cause she was my father's wife.
To complicate the matter even though it brought me joy
I soon became the father of a bouncing baby boy.
My little baby then became a brother-in-law to dad
And so he became my uncle though it made me very sad
For if he is my uncle then that also makes him brother,
To the widow's lovely daughter who, of course, was my step-mother.
Father's wife then had a child which kept them on the run,
And he became my grandchild, 'cause he was my daughter's son.
My wife she is my mother's mother and it makes me blue,
Because although she is my wife, she's my grandmother too.
Now if she is my grandmother then I'm her grandchild
And every time I think of it, it nearly drives me wild,
For now I have become the strangest case you ever saw
As husband of my grandmother I am my own grandpaw!

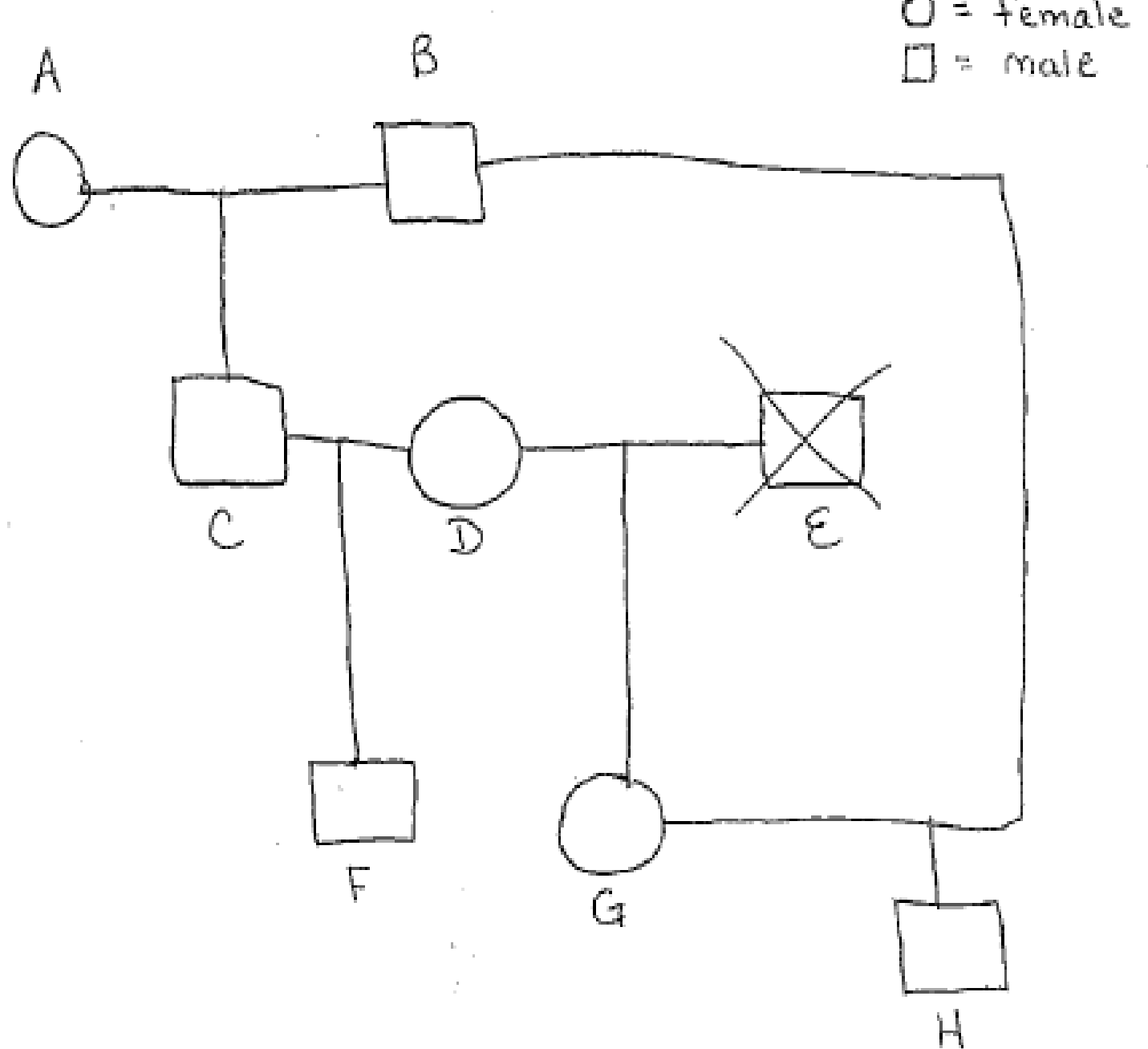
[Song - Ray Stevens- I'm
my Own Grandpa](#)



CHORUS:

Oh, I'm my own
grandpa, I'm my own
grandpa
It sounds funny, I
know, but it really is
so
Oh I'm my own

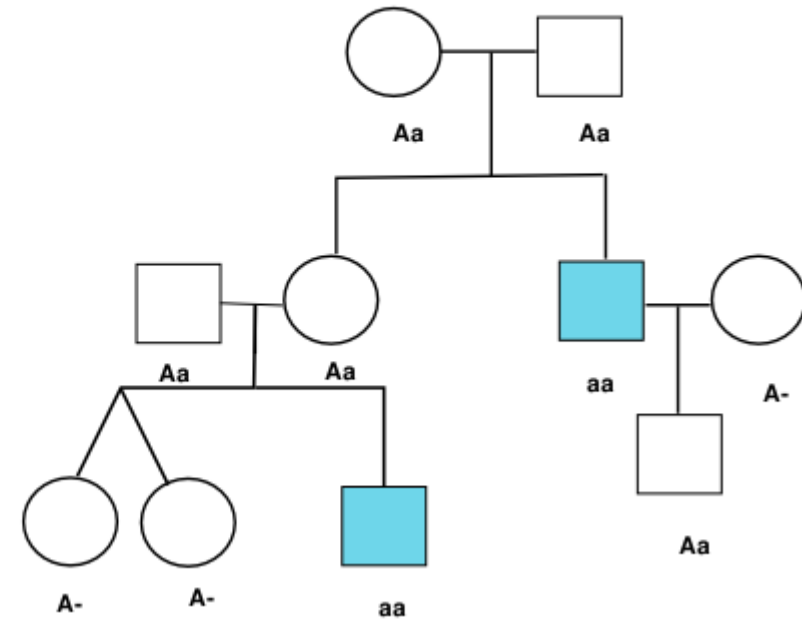
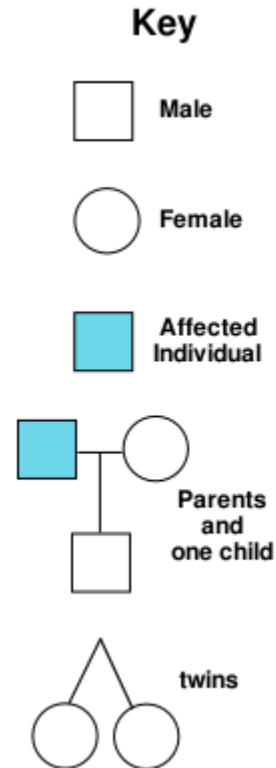
1. Main character **C**
2. Widow **D**
3. Red haired daughter **G**
4. Main character's mother **A**
5. Main character's father **B**
6. Widow's dead husband **E**
7. Main character's son **F**
8. Half-brother **H**
9. Step-daughter/step-mother **G**
10. Step grandson **H**
11. Step grandmother **D**



Reading a Pedigree

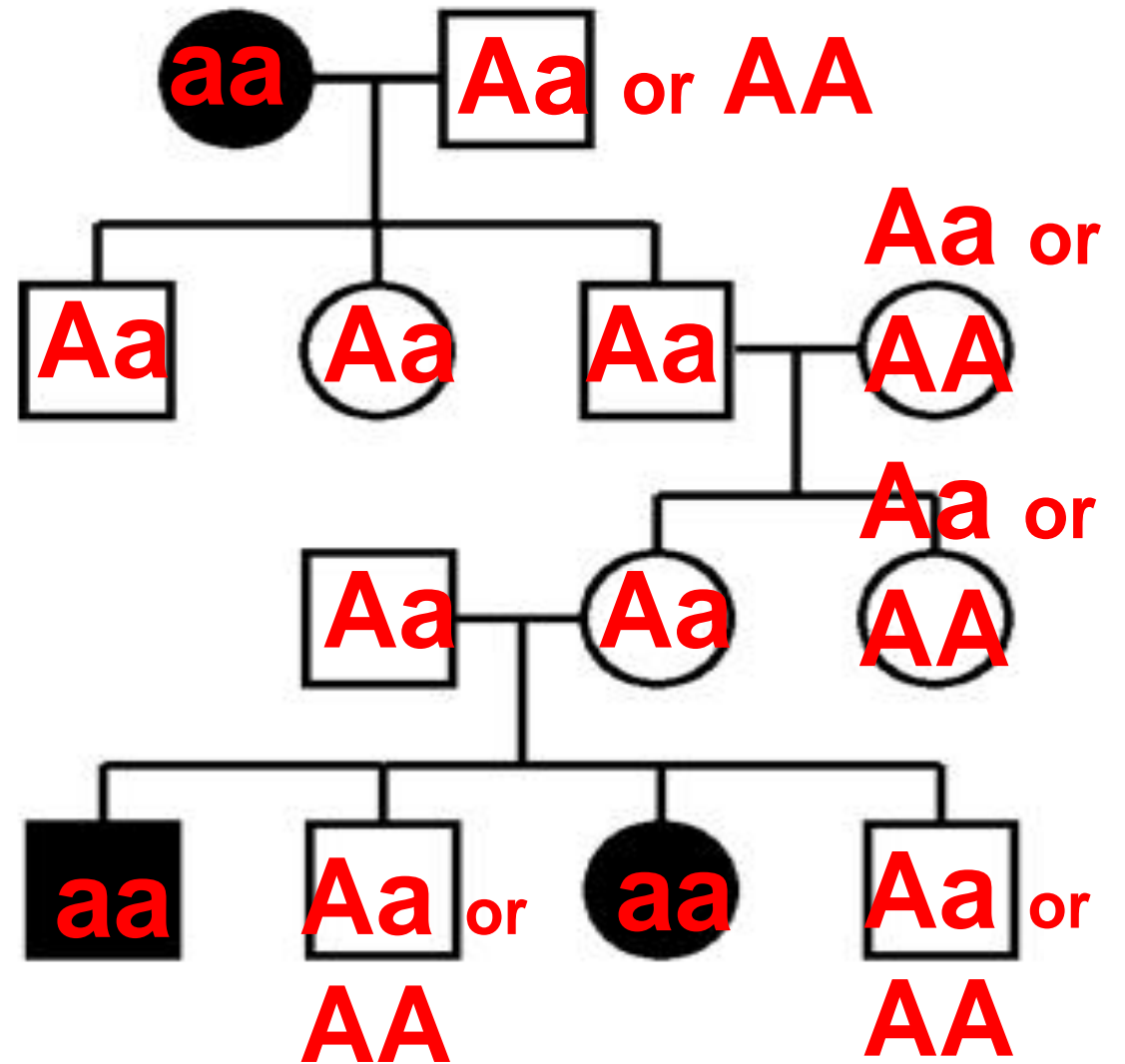
- Siblings are placed in order from left to right according to their birthdate.

- Inheritance patterns:
 - Autosomal recessive
 - Autosomal dominant
 - X-linked recessive
 - X-linked dominant



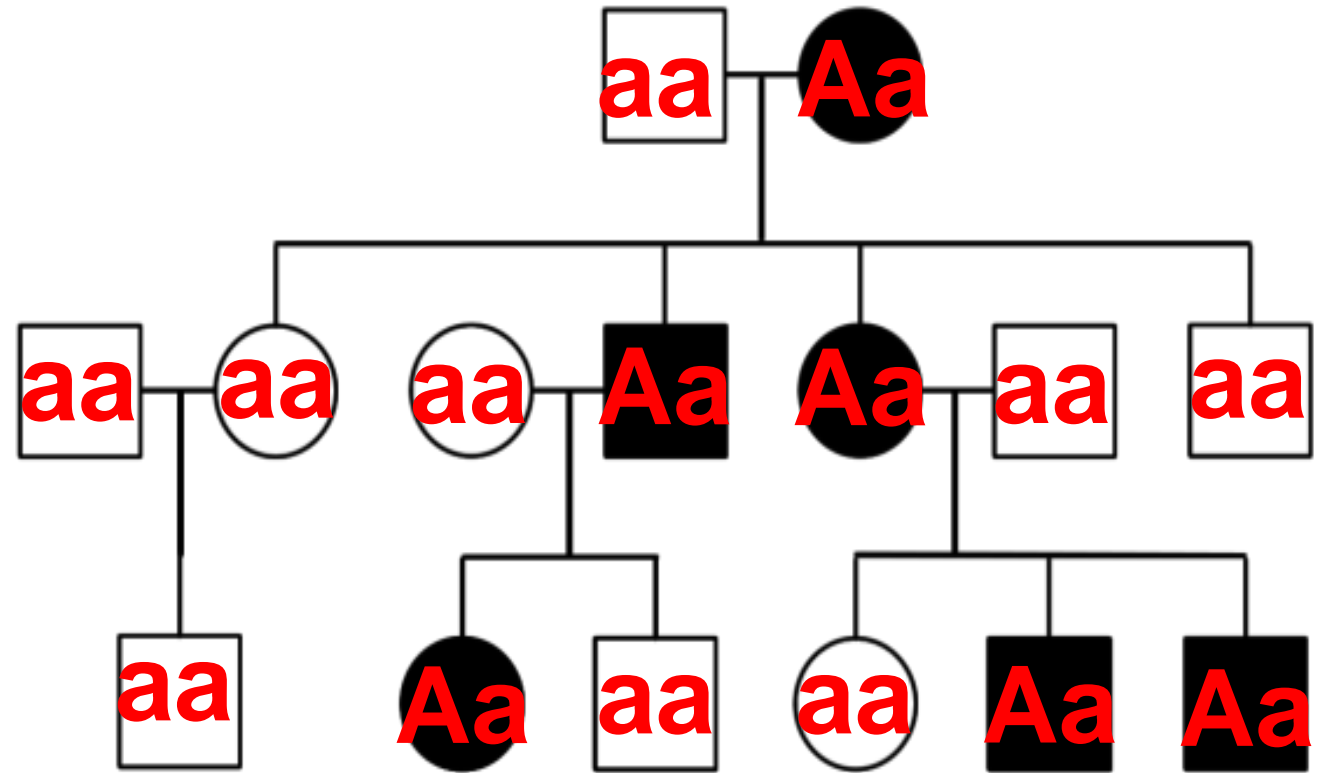
Characteristics of Autosomal Recessive Traits

- Trait is rare in pedigree
- Often skips generations (hidden in heterozygous carriers)
- Affects males and females equally



Characteristics of Autosomal Dominant Traits

- Trait is common in the pedigree
- Found in every generation
- Affected individuals transmit the trait to approximately 1/2 of their children (regardless of sex)



Autosomal Dominant Diseases

❖ There are few autosomal dominant human diseases

Ex. achondroplasia (skeletal disorder causing dwarfism)

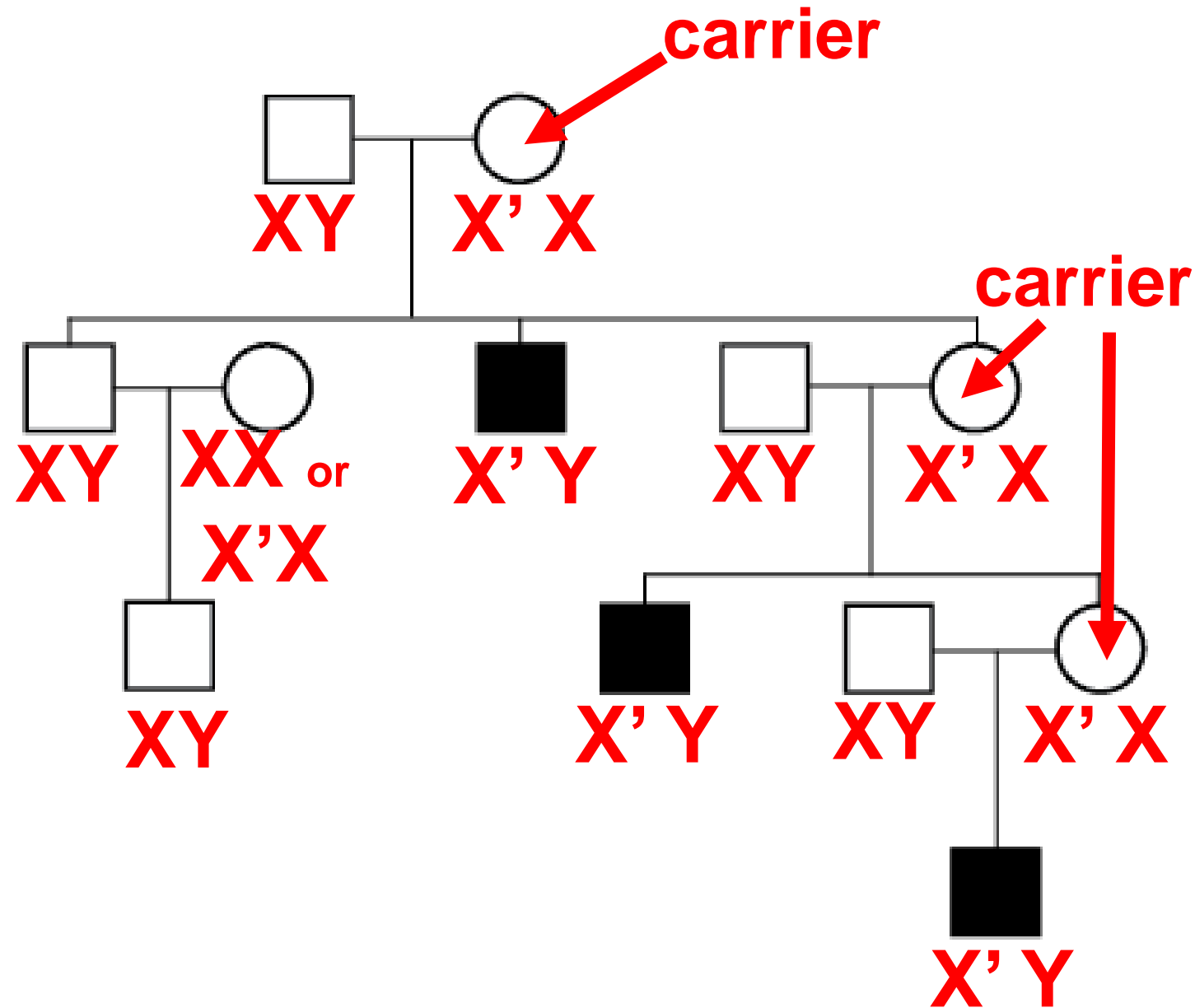
Ex. Polydactyly (extra fingers or toes)

Ex. Huntington disease
(nervous system degeneration,
onset around age 40)



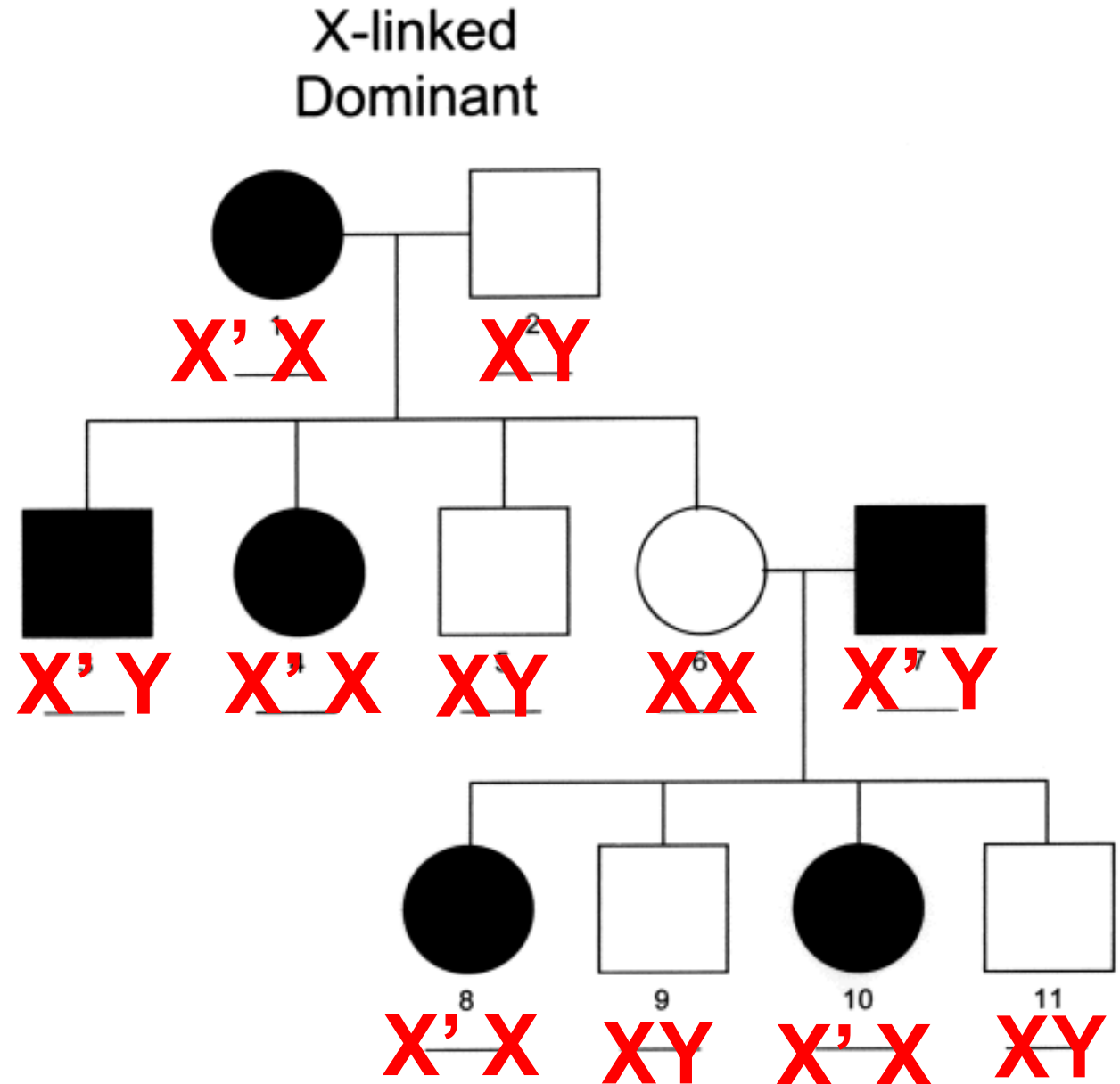
Characteristics of X-linked Recessive Pedigrees

- Trait may be rare in pedigree
- Skips generations
- Affected fathers DO NOT pass to their sons
- Males are affected more often than females because they only have a single X chromosome

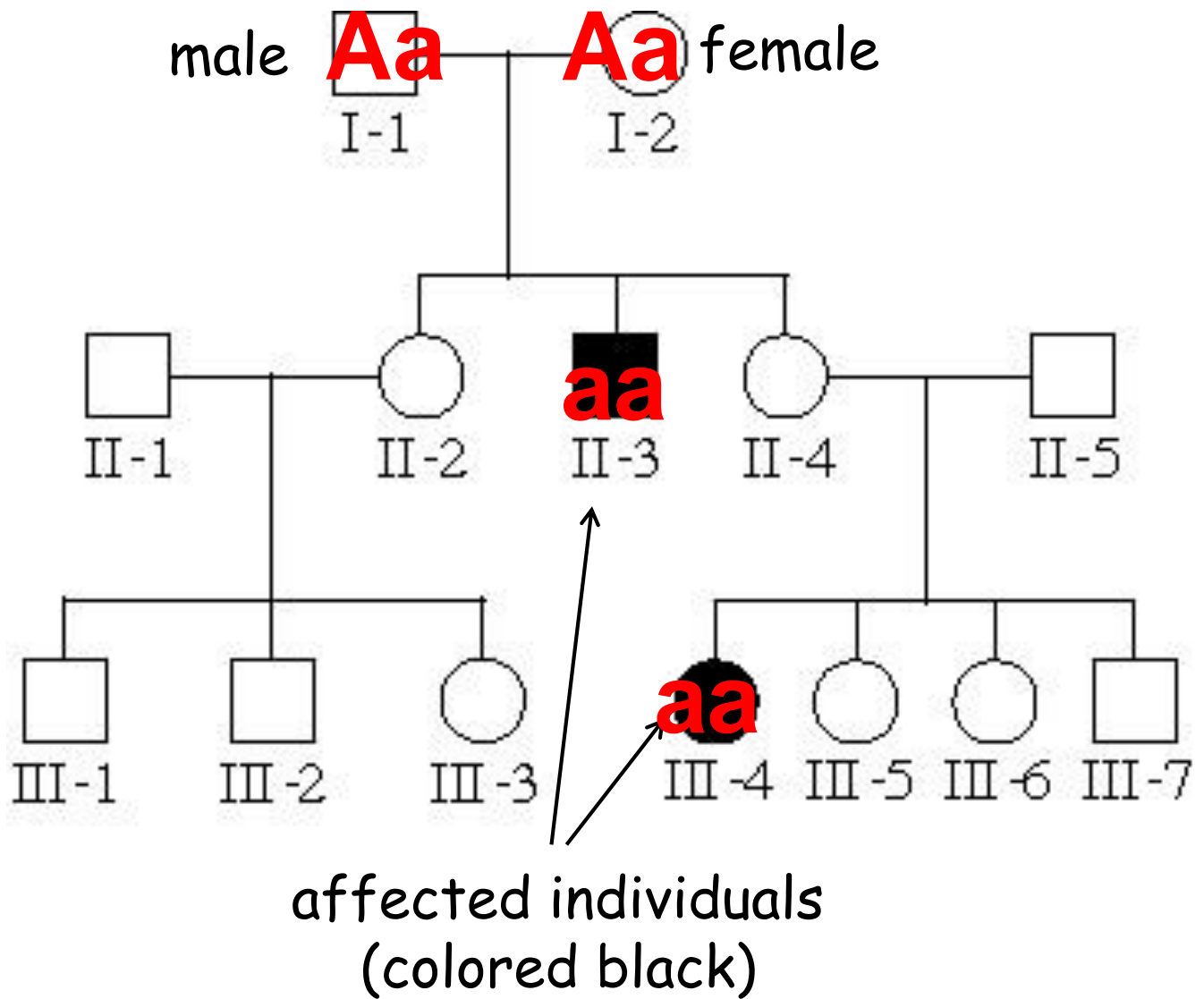


Characteristics of X-linked Dominant Pedigrees

- Trait is common in pedigree
- Affected fathers pass to ALL of their daughters
- Males & females are equally likely to be affected



Sample pedigree - cystic fibrosis



What mode of inheritance is cystic fibrosis?

1. Autosomal recessive

2. Autosomal dominant

3. Sex-linked recessive

4. Sex-linked dominant