

## Step 1: Does sex matter?

- **Look at the affected individuals' sexes:**
  - If **only one sex** (predominantly) is affected → Likely **X-linked recessive, x-linked dominant OR Y-linked** (*first check y-linked because you can easily check all father → son transmission*)
  - If **both sexes equally affected** (roughly) → Likely **autosomal recessive, autosomal dominant or mitochondrial** (*first check mitochondrial because you can easily check. Affected mother = all children affected; affected father = no children affected*)

## Step 2: Does it skip generations?

**(Focus on transmission between biologically related people - parents to offspring)**

- **Skips generations** (affected → unaffected → affected):
  - Pattern: Affected grandparent → unaffected parent → affected grandchild
  - This indicates **RECESSIVE** inheritance
  - Carriers (heterozygotes) don't show the trait
  - Don't forget to consider generation 1 too!!
- **Does NOT skip generations** (appears in every generation):
  - Affected individuals in EVERY generations
  - This indicates **DOMINANT** inheritance
  - Even one copy of the allele causes the trait to appear

## Step 3: Check parent-offspring relationships by testing genotypes to confirm the pattern

**Remember: the genotypes of affected individual are different in dominant vs recessive patterns (versus mitochondrial and y-linked are mostly presence vs absence)**

### For **RECESSIVE** patterns:

- Affected genotype
  - Autosomal recessive = aa
  - X-linked recessive =  $X^aX^a$  OR  $X^aY$
- Unaffected genotype
  - Autosomal recessive = Aa or AA (aka A<sub>-</sub>)
  - X-linked recessive =  $X^AX^a$  OR  $X^AX^A$  (aka  $X^AX^-$ ) OR  $X^AY$

### For **DOMINANT** patterns:

- Affected genotype
  - Autosomal dominant = Aa or AA (aka A<sub>-</sub>)
  - X-linked dominant =  $X^AX^a$  OR  $X^AX^A$  (aka  $X^AX^-$ ) OR  $X^AY$
- Unaffected genotype
  - Autosomal dominant = aa
  - X-linked dominant =  $X^aX^a$  OR  $X^aY$

**NOTICE:** The unaffected vs affected genotypes are opposite when comparing dominant and recessive patterns!