

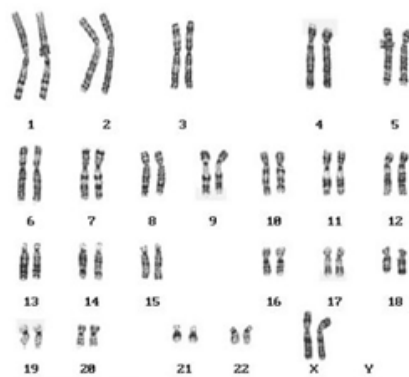


Karyotyping

<http://learn.genetics.utah.edu/content/begin/traits/predictdisorder/>

Karoytype

Real
Karyotype



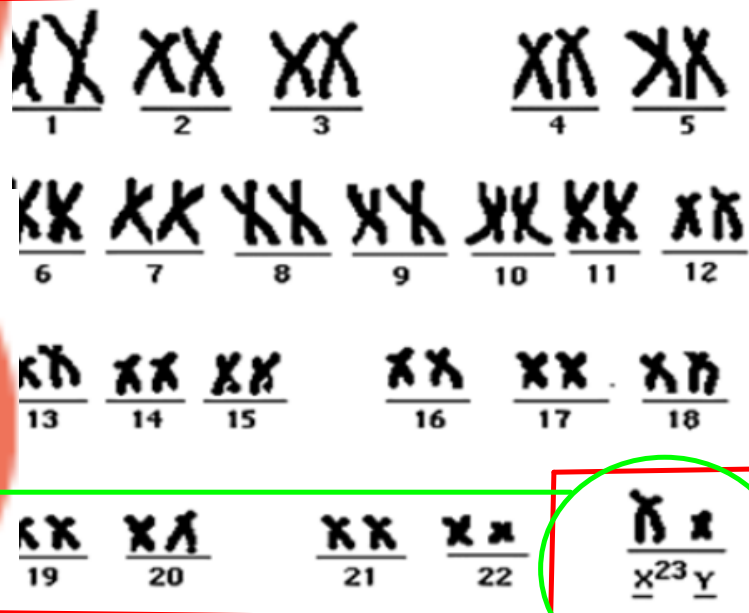
- **Picture** of all the **chromosomes** from a cell of an organism
- Used to help **identify** potential **genetic disorders**
- Used to help **identify** new **species**

- **Chemicals** are used to **stain** chromosomes
- The stain produces **pattern** bands **unique** to each chromosome



- Shows **location** of a **gene** on a **chromosome**
- Shows **changes** in chromosomes
- Example:
 - **too many** (extra #21)
 - **too few** (loss of part of a chromosome)

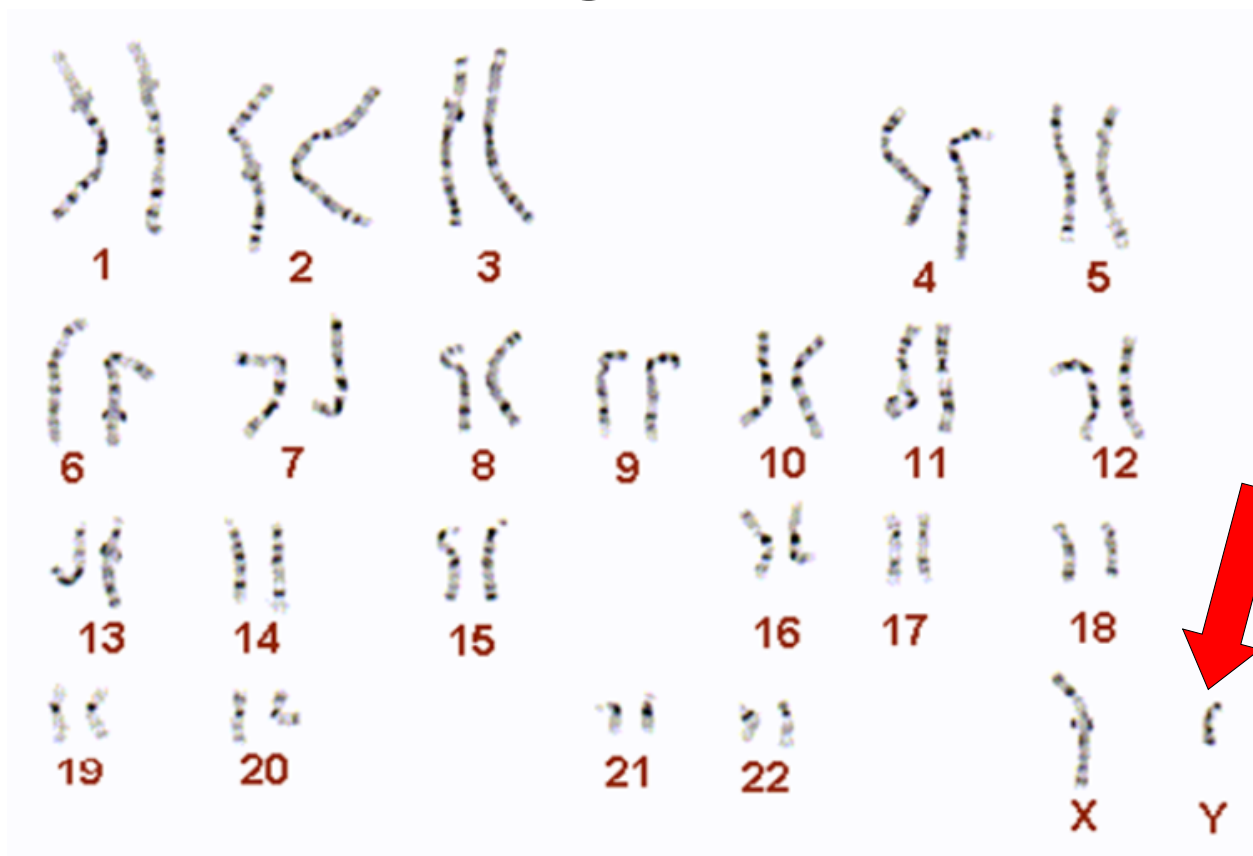
HUMAN CHROMOSOMES



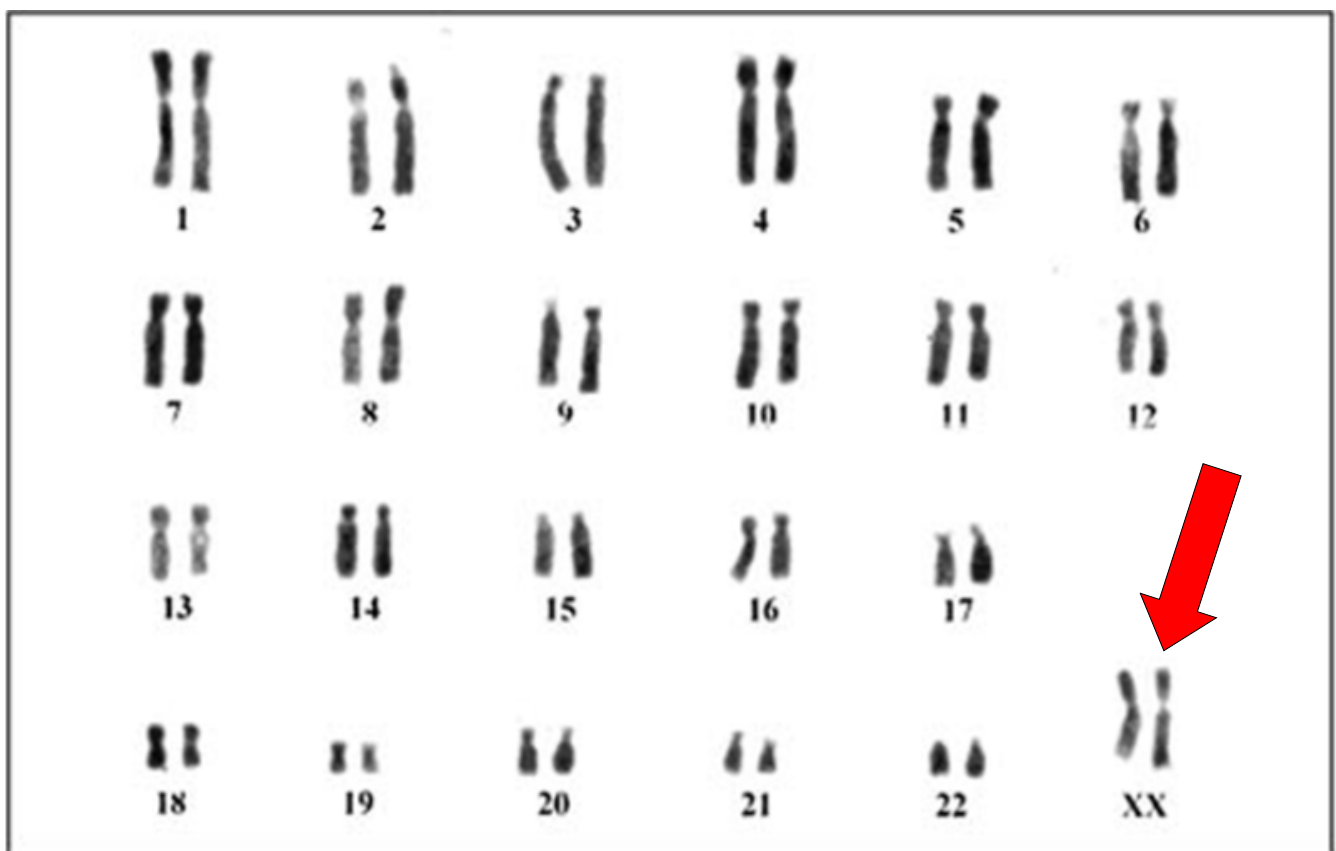
How do chromosomes determine a person's gender?

- In a karyotype, the **last** set of chromosomes determines the sex of the person.
- **XX-means female (same size)**
- **XY-means male (one taller than the other)**

What gender...??



What gender...?



A silly genetics joke...

How do you tell the difference
between male chromosomes
and female chromosomes?

Pull down their genes!



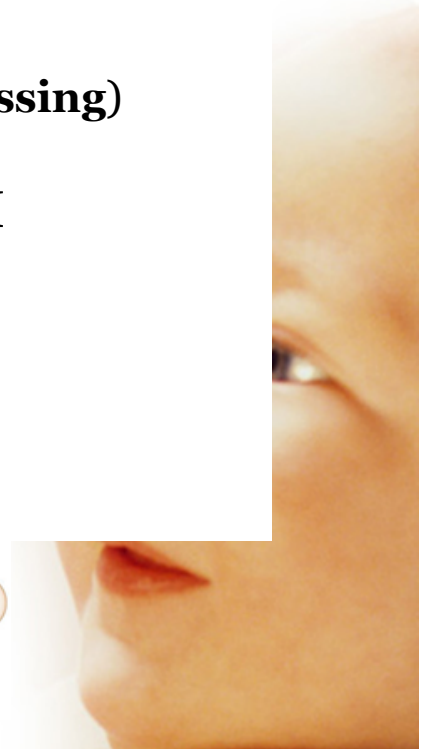
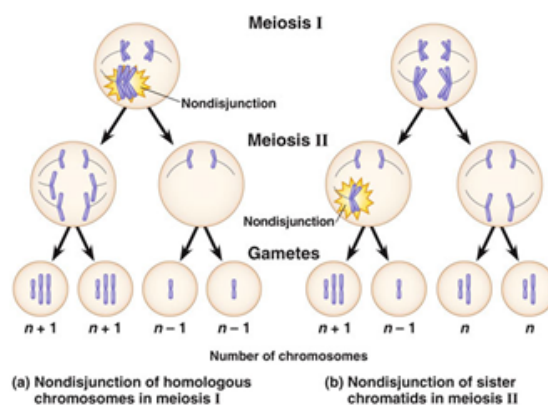
The fact that you have pairs of chromosomes means that you have pairs of genes for every trait

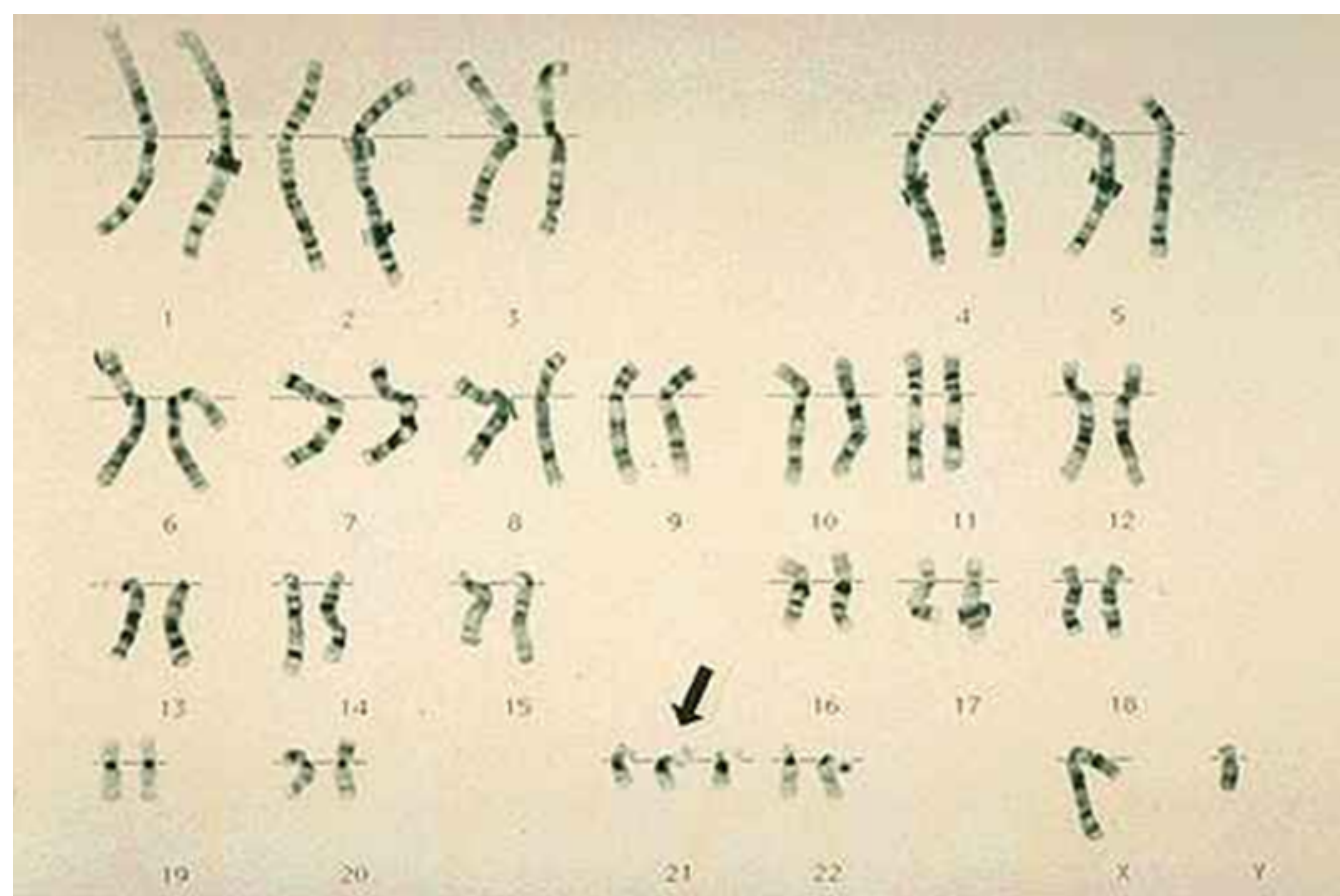
Think about this...

If some disorders are linked directly to the X chromosome, why would males be more at risk for certain genetic disorders?

Non-Disjunction

- **Failure** of chromosomes **pairs** to **separate** during Meiosis = an **imbalance** of **chromosomes**
- Loss = **monosomy** (1 chromosome **missing**)
- Gain = **trisomy** (1 **extra** chromosome)
- Can happen in **Anaphase I** or **II**





Turner Syndrome

- XO Syndrome is more commonly known as Turner Syndrome and affects only girls. There are minimal physical abnormalities and Turner's does not affect intellect.
- The primary effect of Turner's is due to the missing X chromosome. This causes infertility.

Klinefelters Syndrome

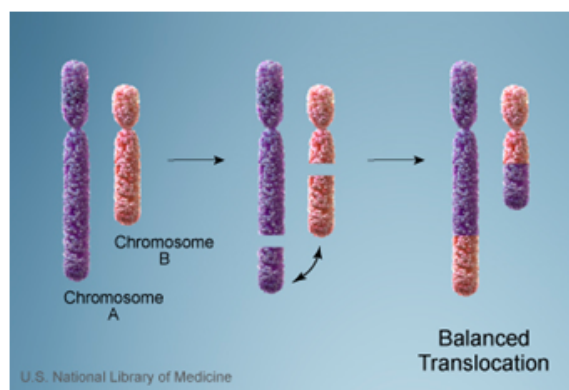
- XXY Syndrome is also referred to as Klinefelters Syndrome.
- This disorder affects only boys.
- Symptoms include: development of breasts, little facial & body hair, rounded body type and an inability to produce sperm.

XYY Syndrome

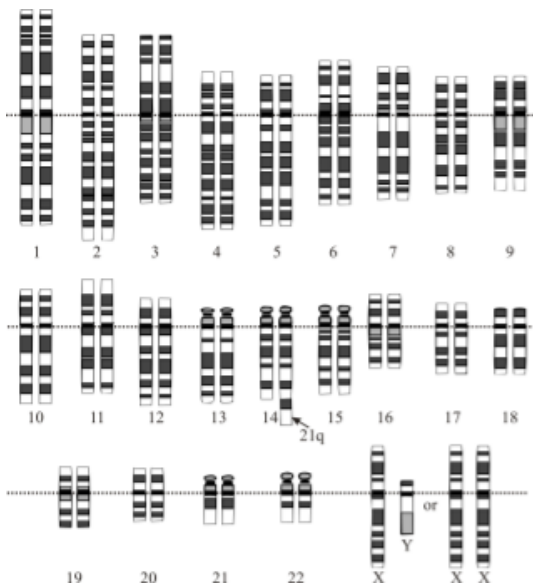
- XYY Syndrome affects only boys.
- There are no noticeable physical differences with this disorder.
- Symptoms include: increased activity, delayed mental maturity, and increased tendency for learning problems in school.

Translocation

- A **piece** of one chromosome **moves** to a **non-homologous chromosome**
- Happens in **Prophase I**
- Usually **reciprocal** – **segments** are **exchanged** between non-homologous chromosomes



Translocation Down Syndrome



- This accounts for 4-5% of Down cases
- This occurs when the 3rd copie of #21 attaches itself to another chromosome (typically #14)
- This effects both the physical and mental development

