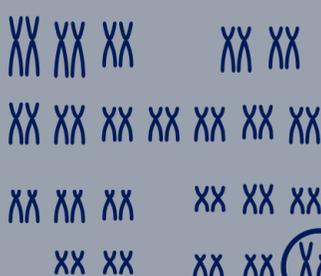


# 12 Neat Facts About the Y Chromosome



## CELL

23 pairs of Chromosomes



Sex Chromosomes

1

In the nucleus of each cell, the DNA molecule is packaged into thread-like structures called **chromosomes**.



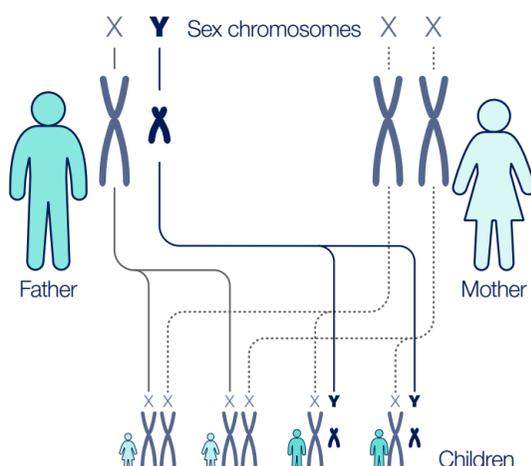
Y Chromosome

2

Most human cells contain 23 pairs of chromosomes. One set of chromosomes comes from the mother, while the other comes from the father. The twenty third pair is called the sex chromosomes, while the rest of the 22 pairs are called **autosomes**.

3

Typically, biologically male individuals have one X and one Y chromosome (XY) while those who are biologically female have two X chromosomes. However, there are exceptions to this rule.

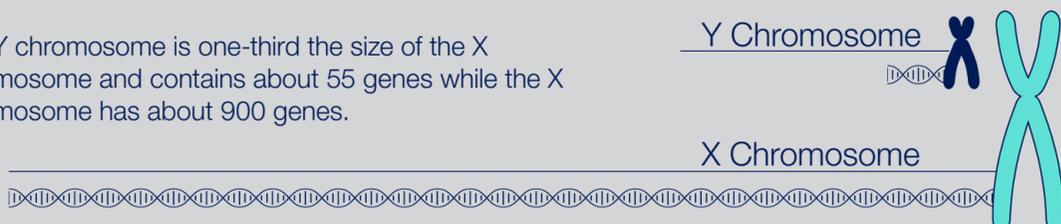


4

The sex chromosomes determine the sex of offspring. The father can contribute an X or a Y chromosome, while the mother always contributes an X.

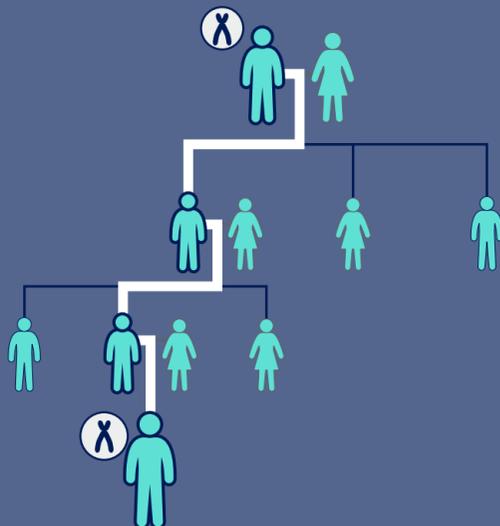
5

The Y chromosome is one-third the size of the X chromosome and contains about 55 genes while the X chromosome has about 900 genes.



6

In genealogy, the male lineage is often traced using the Y chromosome because it is only passed down from the father.



7

All individuals carrying a Y chromosome are related through **a single XY ancestor** who (likely) lived around 300,000 years ago.



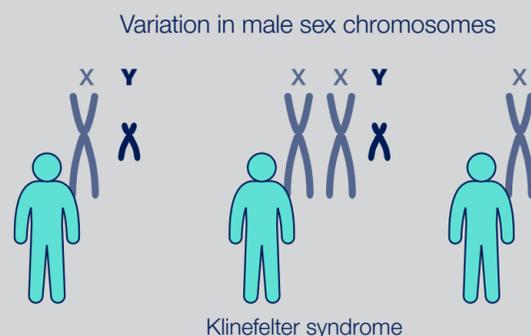
SRY gene

8

The Y chromosome contains a "male-determining gene," the **SRY gene**, that causes testes to form in the embryo and results in development of external and internal male genitalia. If there is a mutation in the SRY gene, the embryo will develop female genitalia despite having XY chromosomes.

9

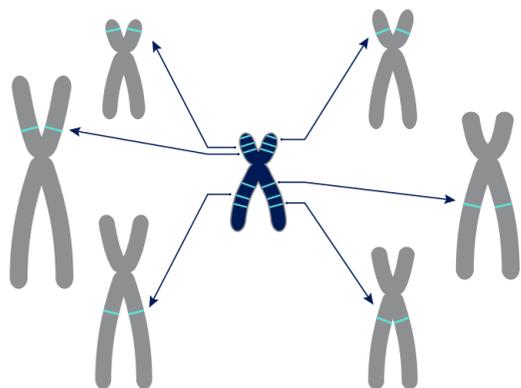
Variation in the number of sex chromosomes in a cell is quite common. Some men have more than two sex chromosomes in all of their cells (the XXY variation is called the **Klinefelter syndrome**), and many men lose the Y chromosome from their cells as they age. Smoking may exacerbate this loss.



Klinefelter syndrome

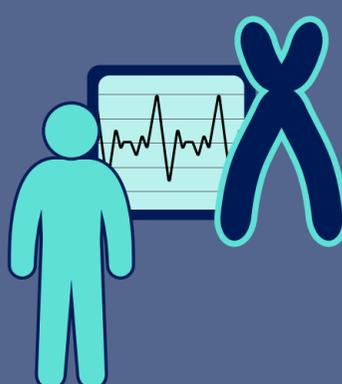
10

Some genes that were thought to be lost from the Y chromosome have actually relocated to other chromosomes.



11

Much of the Y chromosome is composed of **repeating DNA segments**. Specialized techniques are needed to sequence and determine the arrangement of these highly similar segments.



12

Many health conditions are thought to be related to changes in genes expressed on the Y chromosome. This is currently an active area of research.