

# Difference Between Male and Female DNA

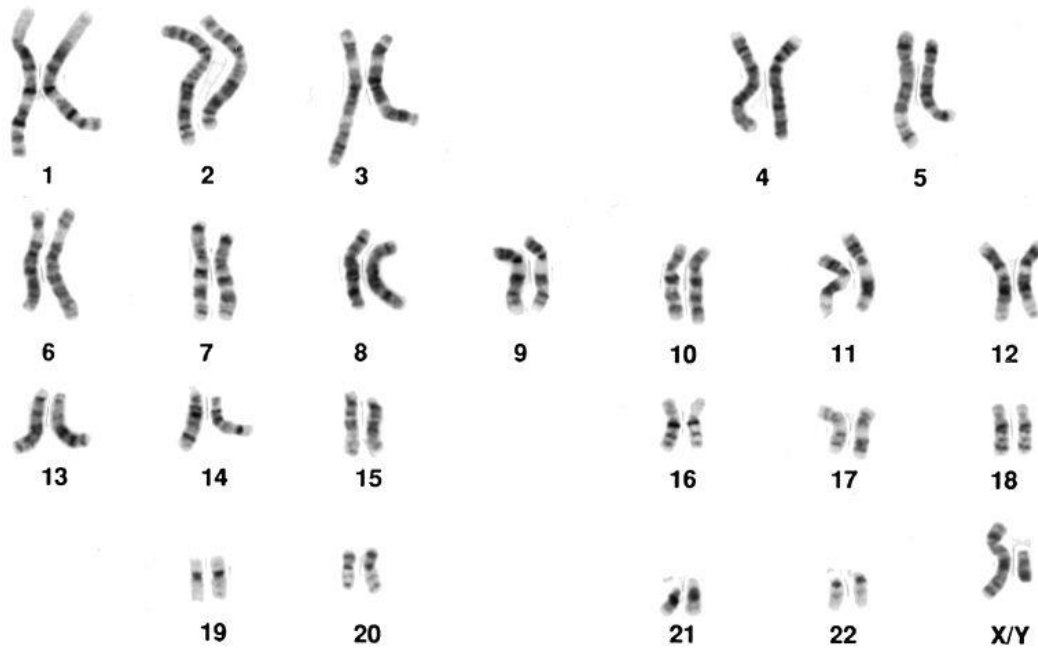
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## Key Difference - Male vs Female DNA

DNA is considered as the building block for living organisms including some viruses. It contains all the genetic information that involves in overall structural and functional aspects of the living organism. Genetic information is stored in chromosomes, and chromosomes are made up of different types of DNA sequences such as coding DNA, non-coding DNA, regulatory sequences etc. Coding DNA is important, and it is responsible for the production of proteins. Coding DNA is arranged as basic units called genes together with non-coding and other gene elements. Genes carry genetic information from parents to offspring. Each cell contains a total of 46 chromosomes (as 23 pairs) tightly packaged inside the cell nucleolus. Among 23 pairs, one pair which is known as sex chromosome pair determines the gender of the offspring. **Male DNA and Female DNA differ from the sex chromosome pair. Male DNA has one X chromosome and one Y chromosome as sex chromosome pair (XY) while female DNA two X chromosomes as sex chromosome pair (XX).** This is the **key difference** between male and female DNA.

## What is Male DNA?

Karyotyping is a technique dealing with the analysis and mapping of total chromosomes in a cell nucleus. Karyotype reveals the size, shape and the number of total chromosomes that are present in a cell. The difference between male and female DNA could be explained with respect to sex chromosome pair possessed by the organisms. When extracting the cells' DNA, male DNA contains one X chromosome and one Y chromosome. They pair up as XY. The X chromosome is received from the ovum of the mother, and the Y chromosome is received from the sperm of father. The presence of Y chromosome confirms the male DNA. The Y chromosome contains a very short arm. The SRY gene that is referred to as testis-determining gene is located on the Y chromosome. This particular gene involves the development of the male embryo and also to develop male secondary sexual characteristics.



## Normal Karyotype

**Figure 01: Male DNA**

In the process of meiosis during sex cell formation, the X and Y chromosomes of males that present as XY chromosomes separate and are passed down to separate gametes as X or Y. When a gamete possesses a Y chromosome, it gives birth to a male offspring.

### What is Female DNA?

Female DNA differs from the male DNA from the pattern of the pairing of sex chromosomes. Therefore, similar to male DNA, the difference of female DNA could be explained with respect to sex chromosomes. Under normal healthy conditions, females contain two X chromosomes that arrange as XX pairing pattern. Karyotype of a female shows two large, similar-sized sex chromosome pair, which is XX. The absence of Y chromosome is the main evidence that reveals the cell DNA is a female DNA. Due to different syndromic conditions, a number of chromosomes in the sex chromosome pair can vary. However, in a healthy cell, female DNA possesses two X chromosomes in the sex chromosome pair.

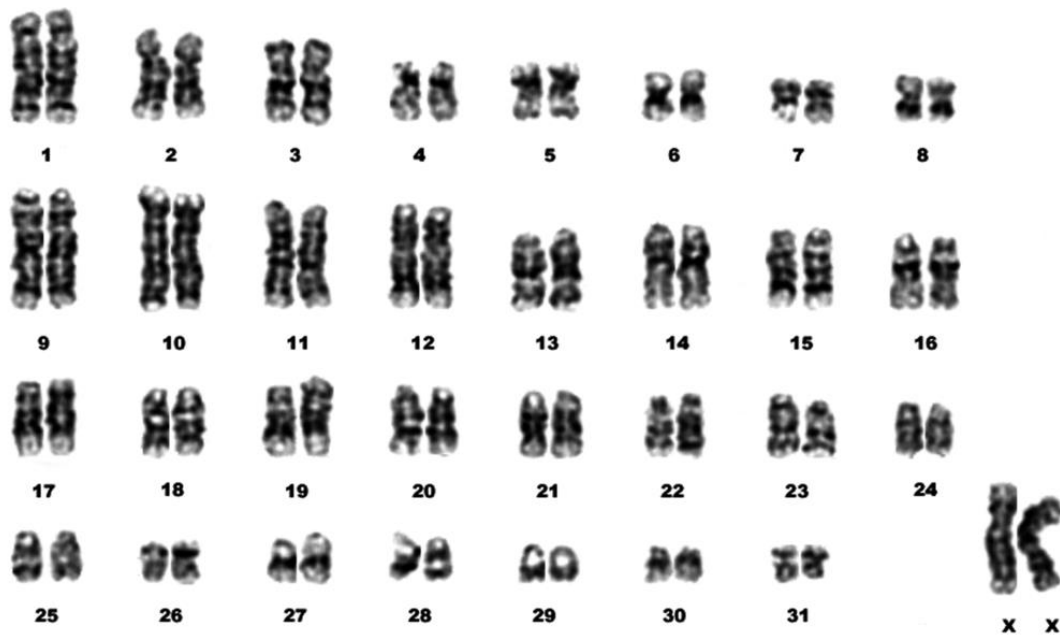


Figure 02: Karyotype of a Female

There are about 800-900 genes present in X chromosome. These genes are involved in providing information for the formation of proteins in the body.

## What are the Similarities Between Male and Female DNA?

- Male and Female DNA is located in the cell nucleus.
- Both Male and Female DNA types have 22 pairs of autosomal chromosomes.
- Both Male and Female DNA contain X chromosome.
- Both Male and Female DNA types are composed of deoxyribonucleotides.

## What is the Difference Between Male and Female DNA?

Male DNA vs Female DNA	
Male DNA contains a pair of sex chromosome composed of one X chromosome and one Y chromosome.	Female DNA contains a pair of sex chromosome composed of two X chromosomes.
Sex- Determining Region Y (SRY)	
Male DNA contains SRY gene.	Female DNA does not contain SRY gene.

## Summary - Male vs Female DNA

DNA is the building block of the heredity. DNA is arranged into genes, and the genetic information is hidden in the genes. Genes carry required genetic information from parents to offspring by the process called inheritance. Genes decide the characteris-

tics of the offspring. Sex chromosome pair of a cell determines the gender of the offspring. The difference between male and female DNA could be explained with respect to sex chromosomes. Male DNA contains one X chromosome and one Y chromosome paired as XY. Female DNA differs from the male DNA from the pattern of the pairing of chromosomes. Under normal healthy conditions, females contain two X chromosomes which arranged as XX pairing pattern. These sex chromosomes are comprised of genes which are related to the sexual development. This is the difference between male and female DNA.

#### **Reference:**

1. "X chromosome - Genetics Home Reference." U.S. National Library of Medicine, National Institutes of Health. [Available here](#)
2. Szalay, Jessie. "Chromosomes: Definition & Structure." LiveScience, Purch, 8 Dec. 2017. [Available here](#)

#### **Image Courtesy:**

1. 'Karyotype (normal)' By National Cancer Institute (Public Domain) via [Commons Wikimedia](#)
2. 'Karyotype of nine-banded armadillo' By Marta Svartman , Gary Stone, Roscoe Stanyon - Svartman M, Stone G, Stanyon R (2006) The Ancestral Eutherian Karyotype Is Present in Xenarthra. PLoS Genet 2(7): e109. <https://doi.org/10.1371/journal.pgen.0020109>, (Public Domain) via [Commons Wikimedia](#)

#### **How to Cite this Article?**

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