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Men From a Genetic Perspective

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CHROMOSOME AND DNA

A chromosome is a structural structure made up of DNA and proteins that holds genetic information in the form of genes. It is found in the nucleus of cells and is required for cell division and replication. DNA, or deoxyribonucleic acid, is the genetic material that provides instructions for the growth, development, function, and reproduction of all living organisms. It is composed of nucleotides and has a double helix structure. The nucleus of a cell, as well as some organelles such as mitochondria, contain DNA. It is the blueprint of the organism and contains all the information needed to generate and sustain life.

Males and females differ in their talents, capabilities, and limitations, as well as their genetic make-up.

This article summarizes the facts regarding male chromosomes that you may be interested in.

DIFFERENCES BETWEEN MALE AND FEMALE CHROMOSOMES

The XY sex-determination system is a technique for classifying various animals, including humans. A pair of sex chromosomes identify an individual's sex under this approach. Females often have two of the same sex chromosomes known as XX chromosomes. This chromosome is referred to as the homogametic sex. Males have two types of sex chromosomes, which are known as XY chromosomes. The heterogametic sex refers to these XY chromosomes.

GENDER DETERMINATION BY THE XY CHROMOSOME

The XY sex chromosomes establish an individual's biological sex, with daughters inheriting an X chromosome from their father for a XX genotype and males inheriting a Y chromosome from their father for an XY genotype. The gender is decided during the fertilization process. The mother exclusively passes on X chromosomes during fertilization. The Y chromosome is passed down from father to son.

As a result, if the baby inherited one X and one Y chromosome, the outcome would be a male person.

For females, one X chromosome will be inherited from their mother and one from their father, resulting in two X chromosomes.

GENDER PROPERTIES DETECTION

Gender is usually determined during conception, when sperm (which can have either an X or Y chromosome) fertilizes the egg (which always has an X chromosome). This determines the sex of the ensuing embryo or fetus, which will contain either XX (female) or XY (male) chromosomes. Gender can also be established via genetic testing, which examines the existence of X and Y chromosomes in a person's DNA.

The standard methods for determining sex chromosomes are as follows:

- ✓ Karyotype analysis
- ✓ Fluorescence in situ hybridization (FISH) analysis
- ✓ Polymerase chain reaction (PCR) analysis
- ✓ Blood testing of pregnant women using non-invasive prenatal testing (NIPT)

IMPORTANCE OF THE Y CHROMOSOME IN MALE

In males, the Y chromosome is one of two sex chromosomes, the other being the X chromosome. This Y chromosome is critical in defining male sex and developing male-specific features. It contains genes that are required for the development of male sexual organs, sperm cells, the immune system, and fertility. The presence of the Y chromosome in humans is responsible for initiating male development. If the Y chromosome is missing, the baby will develop in a female-specific manner.

ROLE OF THE Y CHROMOSOME IN MALE

The SRY gene can be found on every Y chromosome. This gene is essential for the development of male gonads and the differentiation of testes. The presence of the SRY gene leads to the production of male-specific hormones such as testosterone. This hormone influences male sex characteristics such as facial hair, a deep voice, and muscle mass. In addition to sexual development, the Y chromosome carries genes involved in immunological response and reproduction. A few genes on the Y chromosome, such as RBMY and USP9Y, are also required for the growth and maturation of sperm cells in males.

THE Y CHROMOSOMES DISORDER

The Y chromosomes not only define an individual's gender, but they may also influence features other than sexual development. The XYY syndrome disorder is one of the less common instances. This condition is sometimes referred to as Jacob syndrome or Superman syndrome. XYY syndrome is a chromosomal abnormality that affects only males. The existence of an additional copy of the Y chromosome results in a karyotype of 47, XYY, rather than the conventional 46, XY. Physical and behavioral changes can result from this additional chromosome; however, they are not usually severe or visible.

Jacob syndrome is the opposite of Klinefelter syndrome.

Individuals with Klinefelter syndrome have a defective XXY gene, resulting in a karyotype of 47, XXY, as opposed to Jacob syndrome.

CONCLUSION

Understanding genetic variables of the Y chromosome in male genes is critical for discovering their distinct roles. Aside from helping us to understand the history of male lineage, it may explain why some diseases present differently in men and women.