Y Chromosome

The Y chromosome is one of a pair of human sex chromosomes. In the karyotype, it belongs to group G chromosomes, but it is the only one from this group that does not carry satellites. In the latest assembly of the human genome, 589 genes are annotated on the Y chromosome. The Y chromosome is typical for the male sex, men receive this chromosome from their father. The second heterochromosome - the X chromosome - men receive from their mothers.

Genes and heredity

The inheritance of genes located on the Y chromosome has its specific characteristics, as this chromosome is inherited only from father to son. This type of inheritance is referred to as Dutch inheritance.

Pseudoautosomal regions

Certain genes are located in the so-called pseudoautosomal sections of the Y chromosome. These are two sections - PAR 1 (larger section, approx. 2.7Mb = millions of bases, 24 genes) at the end of the short arms and PAR 2 (smaller section, approx. 330kb = thousands bases, 5 genes) at the end of the long arms. Thanks to these regions (primarily PAR1), the X and Y chromosomes can form a "homologous" pair during meiosis; crossing-over can occur between genes in these regions. An example can be the gene SHOXY (Yp11.2; OMIM: *400020) and its homologous gene SHOX (Short Stature Homeobox; Xp22.32; OMIM: *312865).

Selected genes

- **SRY** (sex determining region Y; Yp11.3; OMIM: *480000) - the gene encodes a specific transcription factor that is at the beginning of the cascade determining the development of the male sex. Mutations in this gene cause the development of a female phenotype (female 46,XY), which is associated with gonadal dysgenesis.
- **AZF** (Azoospermia factor regions; Yq11.2; OMIM: #415000) - mutations in this region cause non-obstructive azoospermia.
- **USP9Y** (ubiquitin specific peptidase 9, Y-linked; Yq11.2; OMIM: *400005) - the gene product is ubiquitin-specific protease 9; mutations in this gene are also the cause of male infertility (so-called Sertoli cell only syndrome).

Chromosomal aberrations

Unlike X-chromosome monosomy, Y-chromosome monosomy is not compatible with life.

Syndrome 47,XYY

This syndrome is caused by the presence of two or more Y chromosomes in the karyotype, most often the karyotype 47,XYY. Previously, this syndrome was referred to as "Supermale" - this term is no longer used today. This syndrome has a minimum of clinical symptoms, men may have a taller stature and mild psychosocial disorders (most often learning disabilities). The results of older studies linking this syndrome to aggressiveness and criminal behavior have not been confirmed.

Links

- ws: Chromozom Y

Related articles

- Chromozom
- Gonozomy
- Chromozom X
- Lidský karyotyp
- Chromozomální aberace
- Dědičnost pohlavně vázaná
- Y-vázaná dědičnost

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