Pseudoautosomal region

Pseudoautosomal region are specific regions of both sex chromosomes (that is the, X chromosome and the Y chromosome). Genes are located in these regions , which have their homologous copies (in the same order) also on the second type of heterochromosome. In the case of the X-chromosome, these genes are not subject to Ionisation. For genes located in these regions, the **autosomal type** of inheritance applies.

There 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 of 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 .

Although it might seem logical that PAR1 and PAR2 represent a remnant of the original autosome from which the X chromosome and the Y chromosome arose, it appears that the PAR1 region was added to both chromosomes 29-44 million years ago by a complex process of multiple translocations. PAR2 of the chromosome Y is derived from the chromosome X, its transmission occurred within the evolution of primates about 4-10 million years ago.

An example of a gene in the PAR1 region can be the **SHOX** gene (Short Stature Homeobox; Xp22.32; (OMIM 312865 (https://omim.org/entry/312865)) and its homologue the **SHOXY** gene (Yp11.2; (OMIM 400020 (https://omim.org/entry/400020)).

Links

related articles

- X chromosome
- X-chromosome inactivation
- Sex chromosome
- Turner syndrome
- X-linked inheritance

References

- THOMPSON, James Scott – THOMPSON, Margaret Wilson – NUSSBAUM, Robert L, et al. *Klinická genetika: Thompson & Thompson.* 6. edition. Prague : Triton, 2004. 426 pp. ISBN 80-7254-475-6.
- ŠÍPEK, Antonín. *Genetika* [online]. [cit. 2009]. <http://www.genetika-biologie.cz/>.