X-chromosome inactivation

Template:Checked **Inactivation of the X chromosome'** or **lyonization** occurs in the early stages of development (approximately at the embryo stage of 100-200 cells) in the event that [[Human karyotype|karyotype]] contains more than one X chromosome (most often in the case of the normal female karyotype 46,XX; however, it also occurs in males with Klinefelter syndrome - karyotype 47,XXY and in other pathological karyotypes with by more than one X chromosome so that in the final state there is only one active X chromosome in the cell). The inactivation of the X chromosome is **random** in every cell of the embryo, but also *permanent*, since all other cells arising from the division of this cell will already have the same inactivated chromosome, whether of maternal or paternal origin. The inactivated X chromosome in this way represents a deposit of highly condensed **chromatin**, visible as a so-called **Barr body'** or **sex chromatin**. Individuals with monosomy 45,X, like 46,XY males, do not have Barr bodies. The inactivation process is controlled by a regulatory region known as the X-inactivation center (XIC). Among other things, the gene for non-coding RNA ***XIST*** (*X inactive specific transcript (non-protein coding)**; Xq13.2; is located in this region /entry/314670 OMIM: *314670 (https://omim.org))) and several of its regulators including the '*'**TSIX'** gene (*TSIX transcript, XIST antisense RNA*; Xq13.2; org/entry/300181 OMIM: *300181 (https://omim.)). It is the RNA product of the *XIST* gene that induces changes in the conformation of the X chromosome, which ultimately lead to its inactivation.

Genes stored in the pseudoautosomal region of the X chromosome are not inactivated.

The inactivation of the X chromosome is also called the ``Lyonization process *in honor of the British geneticist Mary Frances Lyon (1925-2014), who first described this process in 1961.*

Links

ws:Inaktivace chromozomu X

Related Articles

- X chromosome
- Sex chromosomes
- Pseudoautosomal region
- X-linked inheritance

Source

ŠIPEK, Antonín. *Genetics* [online]. [feeling. 29/05/2009]. < http://www.genetika-biologie.cz/karyotyp-cloveka >.