**Ankara University Medical Faculty**

**Cell Biology Practice:X-inactivation (Barr body)**

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Both female and male cells contain an equal number of autosomal chromosomes, males have one X and females have two X chromosomes in humans. The difference in X chromosome dosage between the two sexes is compensated by mechanisms that regulate X chromosome transcription. 'Dosage' of a chromosome (or a gene) refers to its genomic copy number.

A dosage compensation mechanism which leads to transcriptional silencing of one X-chromosome in females has evolved to achieve an equal expression level of X-linked genes in both sexes.

According to the **Lyon hypothesis**, **X chromosome inactivation** (XCI) occurs randomly during embryonic development with respect to the parental origin, and is then stably maintained through a near infinite number of cell divisions.

Various epigenetic changes like DNA methylation involved in X chromosome inactivation (Xi) which contributed to chromosome silencing. In somatic cells, the inactive X chromosome is visible as a region of dense chromatin called the Barr body.

Barr bodies are visible at interphase, and located in the nucleus close to the nucleus membrane.

* Number of Barr bodies is calculated with the formula bellow;

Number of Barr bodies = Number of X chromosome – 1

Materials:

* Cover slip
* Glass Slide
* Flat toothpick
* Aceto orcein stain

Methods:

1. Put a drop of aceto orcein stain in the center of the slide.
2. Gently scrape the inside of your cheek with toothpick (mucosal epithelial cells).
3. Spread the cells in the drop of water.
4. Place cover slip on top of the specimen.
5. Observe under microscope.
6. Count the number of X chromatin in your sample, find percentage rate of X chromatin.
7. You have to count only X chromatin that are closest the nuclear envelope
8. Drove X chromatins(Barr body) according to the karyotype on the figures below and write the names of the structure pointed with the arrow.

 47,XXX 47,XXY