

## ***Barr Body***

### ***Mystery in Origin & Ignorance in Function***

**N.B.**

*The Arabic version of this article is the reference,  
read it on one of the following links:*

خُلِقَتْ حَوَاءٌ مِنْ ضَلْعِ آدَمَ  
رَائِعَةُ الْإِنِحَاءِ الْفَلَسَفِي وَالْمَجَازِ الْعِلْمِي  
وَجَسِيمُ بَارٍ.. هُوَ الشَّاهِدُ وَهُوَ الْبَصِيرَةُ



*Barr body is omnipresent in the human female somatic cells. Since its discovery by Murray Barr in 1949, Barr body rests the most mysterious secret of human cell. For a long time, its origin and its function have alimented the academic debates. Since, any of the related hypothesis has not gotten the unanimity.*

*Therefore, I tried to dive deep into the cell and find out what could be the reality. Astonishingly, in the passage, many other secrets have turned out. Hereafter, you will find out the whole story.*

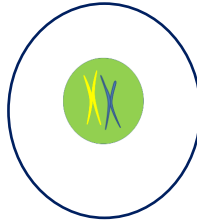
### ***Barr Body***

*I do believe in the common origin of both genders from one stem cell; I named it the Mother Stem Cell (MSC). The MSC contained in its nucleus 22 pairs of autosomal chromosomes specific to the human space, in addition to the precursor of the sexual chromosomes (i.e., the precursor of the pair chromosomes XX and the pair chromosomes XY). I suppose it should be the chromosome pXX with the prefix (p) to differentiate it from the female sexual chromosomes XX, which is a little bit different, as we will see later; **figure (1)**.*

**N.B:** For more details, see also the linked video:

[Barr Body, The Whole Story](#)





**Figure (1)**

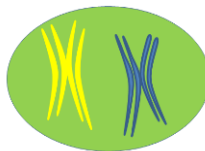
***The Mother Stem Cell (MSC)***

*It contains 22 pairs of autosomal chromosomes,  
in addition to the precursor of both sexual chromosomes XX & XY.*

*During the asexual reproduction (The Mitosis) of the MSC, its chromatin storage had been duplicated in preparation to its supposed-equal distribution between the two supposed-identical daughter cells. **Mistakenly, as mitosis was going on to distribute the chromatin matter into the two daughter cells; a segment of one X of the pXX had been avulsed from one daughter cell in profit to the other daughter cell. The looser daughter cell became with the sexual chromosomes X and Y, whereas the winner daughter cell became with the sexual chromosomes X and X; figure (2).***

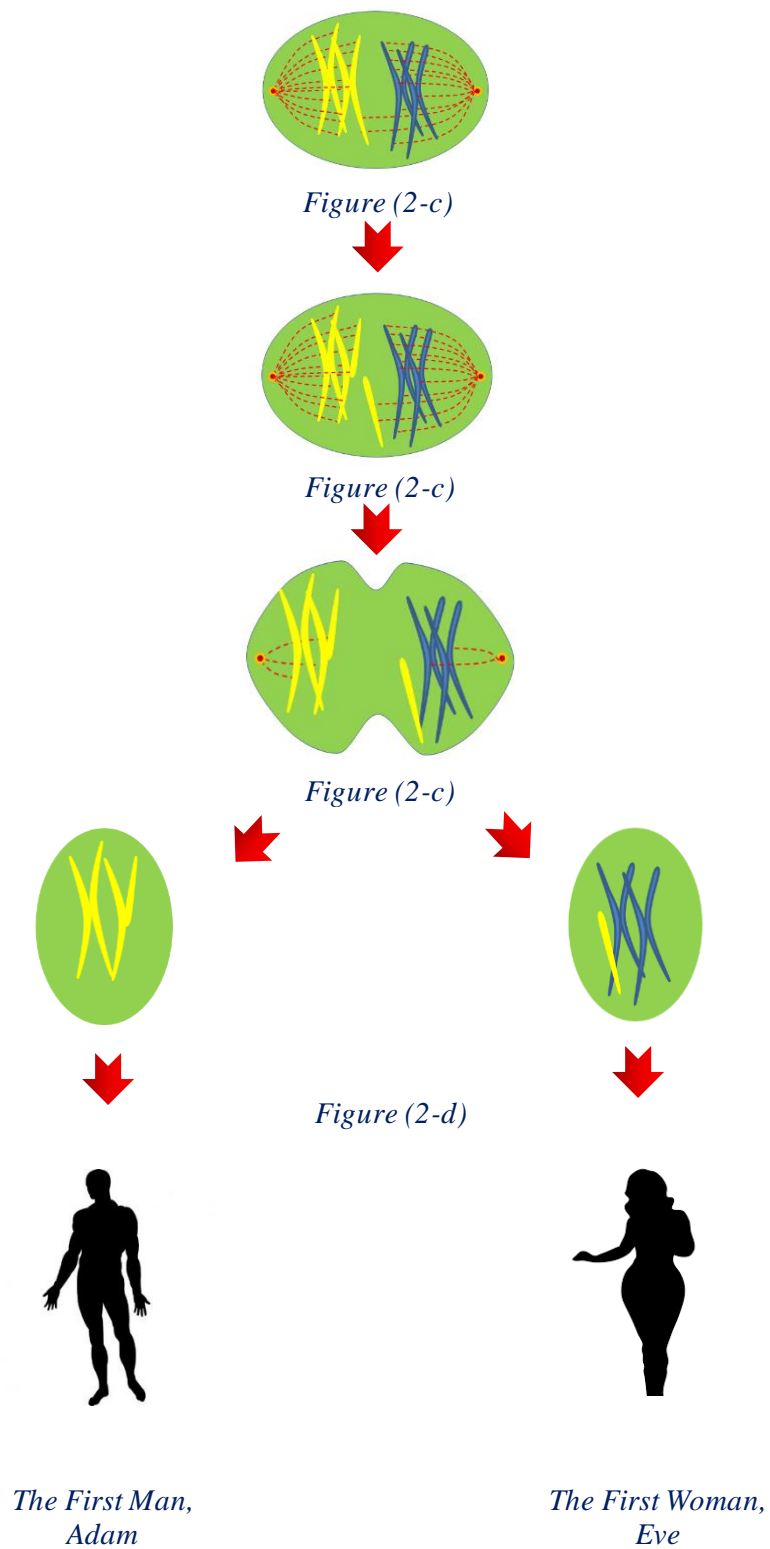


**Figure (2-a)**  
***Mother Stem Cell (MSC)***



**Figure (2-b)**





**Figure (2):**  
**The Original Sin**  
(N.B. You can see a related animation in this link)



**Figure (2-a):** The Mother Stem Cell (MSC) contains 22 pairs of autosomal chromosomes & the precursor of both sexual chromosomes (pXX).  
For more simplicity, the pXX only is here represented.  
(pXX= the precursor of both sexual chromosomes XX and XY)

**Figure (2-b):** During the asexual reproduction (Mitosis), the chromatin storage of the MSC, represented here by the pXX, was duplicated in order to be equally distributed between the two daughter cells.

**Figure (2-c):** During the anaphase, a segment of the chromosome X is stolen from one daughter cell in profit to the second daughter cell.

**Figure (2-d):** The looser daughter cell became the male cell (in right) with the sexual chromosomes X and Y. The winner daughter cell (in the left) became the female cell with the sexual chromosomes X and X, in addition to the new element that was stolen from the first daughter cell.

(Yellow segment = the stolen segment)

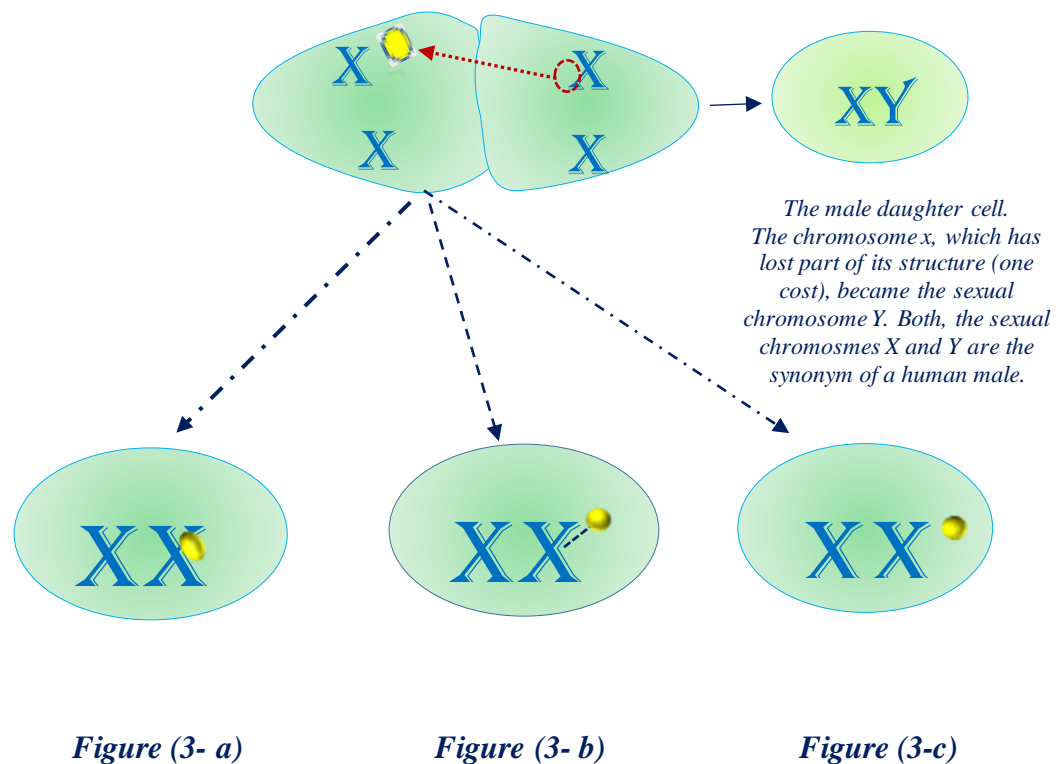
## **The Stolen Segment and Barr Body**

The stolen segment is supposed to be in the nucleus of the recipient cell (i.e., The Female Daughter Cell). I suggest three forms of its existence there:

- 1- It might be integrated within the structure of the sexual chromosome X itself rendering it bigger (i.e., of a higher molecular weight) than its homologue the other chromosome X of the same cell. This dissimilarity between the two sexual chromosomes X and X is crucial concerning the formation of Barr body in the descending female somatic cells. Early, the heavier one (the giant chromosome X) will form Barr body in each female somatic cell; **figure (3- a)**.
- 2- It might also be attached to the sexual chromosome X by a microtubule, which is a vestige of the spindle apparatus, forming together a new structure of two distinguishable components. Similarly, the new structure (chromosome X + stolen segment) is of a higher molecular weight than the other chromosome X of the same cell, and it could be Barr bod; **figure (3- b)**.
- 3- It may rest free in the nucleus of the recipient cell forming an independent body. This body will be omnipresent in all female somatic cells, and will be later called Barr body; **figure (3-c)**.

According to the first two hypotheses, the two sexual chromosomes X and X, which are identifying the female somatic cells, are not identical as was

thought for a long time. One of them is heavier than its homologue. The heavier sexual chromosome X should be Barr body. Whereas, in the third hypothesis, the stolen segment forms per se Barr body; **figure (3)**.



**Figure (3):**  
**During the asexual reproduction (The Mitosis)**  
**of the Mother Stem Cell,**


A segment of the chromosome X (in red dashed circle) of one daughter cell was avulsed in profit to the chromosome X of the second daughter cell.

**Figure (3-a):** The avulsed segment (yellow circle) is quite integrated in the structure of the chromosome X rendering it bigger (i.e., of higher molecular weight) than its homologue.

The giant chromosome X could be the future Barr body found in all female somatic cells.

**Figure (3-b):** The avulsed segment (yellow circle) is attached, by a micro band (dashed line), to the chromosome X forming together one structure of two distinguishable components. The bi-component structure is of a higher molecular weight than the other chromosome X, and is the progenitor of the Barr body. The micro band is a remnant of the spindle apparatus.


**Figure (3-c):** The avulsed segment (yellow circle) could stay independent in the nucleus of the recipient cell. This free body might be the origin of the Barr body.

*N.B: [For more details, see also the linked video:](#)  
[click on this link:](#) *

## ***Barr Body, The Functions***

*Barr body is omnipresent in the woman's somatic cells, and has probably two essential functions:*

- 1- The additional genes that are provided by Barr body, direct and dictate the cell development (differentiation) in a feminine direction.*
- 2- Barr body offers the possibility of two different types of oocytes; the male oocyte and the female oocyte. The presence of Barr body is the synonym to a female oocyte (FO). A female oocyte does not give but a female embryo.*

*N.B: For more details, one can also read my related article on this link:  
[Who decides the sex of coming baby?\(Innovated\)](#)  
And also, the linked video: *

## ***Conclusion***

*Since its discovery in 1949, Barr body has received a great attention. The scientists agreed on its existence in the nucleus of the female cell (XX\*), and its absence in the normal male cell (XY). However, the origin as well as the functions of Barr body rest vague and rest at the core of a large controversy. Finally, they arrived to a certain conclusion, which is the hypothesis of Mary Lyon in 1961.*

*The Lyonisation Hypothesis suggests that one of the two chromosomes XX of female cell (XX\*) should be deactivated in order to control the over dose delivered by the sexual genes of the two chromosomes X & X\*. This process is termed as a Dosage Compensation. The deactivated chromosome X will form Barr body inside the nucleus of the female cell (XX\*). Moreover, it supposed the deactivated chromosome X to come from the father or the mother.*

*Mary Lyon claimed the presence of a certain (Xist) gene carried on one of the two chromosomes XX, and the presence of a certain (Tsix) gene carried on the second chromosome X. The Xist-bearing chromosome X will be the inactivated chromosome X, which is the future Barr body, early during embryonic development. Whereas, Tsix-bearing*

*chromosome X will remain functional in the nucleus of the female somatic cell.*

*Based on Lyon hypothesis, the X-Xist & X-Tsix chromosomes continue to function effectively within the progenitor cell. Next, the oocytes themselves will carry either the X-Xist chromosome or the X-Tsix chromosome.*

*Similarly, in the man, the X- spermatozoid, will be either carrier of the Xist gene or porter of the Tsix gene. Now, give the X-Xist spermatozoid fertilized the X-Xist oocyte, or the X-Tsix spermatozoid fertilized the X-Tsix oocyte. What to do then? Which chromosome X will be functional, and which one would be deactivated? This is undoubtedly a great deficiency in Lyon hypothesis.*

*Secondly, in sex-related hereditary diseases, how could the woman be a disease- carrier with one functional chromosome X in the nucleus of her somatic cell?*

*Assuming the functional chromosome X carries the pathological gene of the hereditary disease, then the disease will clearly affect the woman. Now, on the contrary, assuming the non-functional chromosome X is the porter of the pathological gene of the hereditary disease, the disease will then totally disappear. There is no middle ground between this and that, as Lyon hypothesis requires. The woman is either affected by the sex-related hereditary disease or not. So, there is no woman who is a disease porter.*

*Thirdly, the coloration and the appearance of Barr body with the immune techniques and colorants that target chromosome X support the hypothesis of the origin of Barr body from the chromosome X. Therefore, this argument strengthens both hypotheses; Lyon hypothesis and my innovated hypothesis. The two hypotheses share the birth of Barr body from the sexual chromosome X, although they differ in the mechanisms of occurrence.*




















*Lyon hypothesis claims the excessive presence of sexual genes on the two chromosomes X. To avoid an excessive supply of sexual genes, the female cell exempts one of the two existing chromosomes X from service and keeps the second active. So accordingly, Barr body must be the deactivated chromosome X, and the other chromosome X should be the female functional chromosome.*



























*In contrast, my hypothesis considers Barr body to be the only sexual chromosome in the female cell. Actually, I do believe Barr body to be the only functional sexual chromosome X. While, the other chromosome X is just a porter chromosome, and a great doubt revolves around its sexuality.*
























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*In another context, you can read:*

-  [Neural Conduction, Personal View vs. International View \(Innovated\)](#)
-  [Upper Motor Neuron Lesions, Pathophysiology of Symptomatology](#)
-  [Neural Conduction, Action Pressure Waves \(Innovated\)](#)
-  [Neural Conduction, Action Potentials \(Innovated\)](#)
-  [Neural Conduction, Action Electrical Currents \(Innovated\)](#)
-  [The Function of Action Potentials \(Innovated\)](#)
-  [The Three Phases of Neural Conduction \(Innovated\)](#)
-  [Neural Conduction in the Synapse \(Innovated\)](#)
-  [Sensory Receptors](#)
-  [Nodes of Ranvier, the Equalizers \(Innovated\)](#)
-  [Nodes of Ranvier, the Functions \(Innovated\)](#)
-  [Nodes of Ranvier, First Function \(Innovated\)](#)
-  [Nodes of Ranvier, Second Function \(Innovated\)](#)
-  [Nodes of Ranvier, Third Function \(Innovated\)](#)
-  [Node of Ranvier The Anatomy](#)
-  [The Philosophy of Pain, Pain Comes First! \(Innovated\)](#)
-  [The Philosophy of the Form \(Innovated\)](#)
-  [Spinal Injury, Pathophysiology of Spinal Shock, Pathophysiology of Hyperreflexia](#)
-  [Who Decides the Sex of Coming Baby?](#)



-  [Spinal Shock \(Innovated\)](#)
-  [The Clonus \(Innovated\)](#)
-  [Hyperactivity Hyperreflexia \(Innovated\)](#)
-  [Hyperreflexia, Extended Sector of Reflex](#)
-  [Hyperreflexia, Bilateral Responses](#)
-  [Hyperreflexia, Multiple Responses](#)
-  [Nerve Conduction Study, Wrong Hypothesis is the Origin of the Misinterpretation \(Innovated\)](#)
-  [Wallerian Degeneration \(Innovated\)](#)
-  [Neural Regeneration \(Innovated\)](#)
-  [Wallerian Degeneration Attacks Motor Axons, While Avoids Sensory Axons](#)
-  [Barr Body, the Whole Story \(Innovated\)](#)
-  [Boy or Girl, Mother Decides!](#)
-  [Adam's Rib and Adam's Apple, Two Faces of one Sin](#)
-  [The Black Hole is a \(the\) Falling Star?](#)
-  [Adam's Rib, could be the Original Sin?](#)
-  [Pronator Teres Syndrome, Struthers Like Ligament \(Innovated\)](#)
-  [Function of Standard Action Potentials & Currents](#)
-  [Posterior Interosseous Nerve Syndrome](#)
-  [Spinal Reflex, New Hypothesis of Physiology](#)
-  [Hyperreflexia, Innovated Pathophysiology](#)
-  [Clonus, 1<sup>st</sup> Hypothesis of Pathophysiology](#)
-  [Clonus, 2<sup>nd</sup> Hypothesis of Pathophysiology](#)
-  [Clonus, Two Hypotheses of Pathophysiology](#)
-  [Hyperreflexia \(1\), Pathophysiology of Hyperactivity](#)

-  [\*Hyperreflexia \(2\), Pathophysiology of bilateral Responses\*](#)
-  [\*Hyperreflexia \(3\), Pathophysiology of Extended Hyperreflex\*](#)
-  [\*Hyperreflexia \(4\), Pathophysiology of Multi-Response Hyperreflex\*](#)
-  [\*Barr Body, the Second Look\*](#)
-  [\*Mitosis in Animal Cell\*](#)
-  [\*Meiosis\*](#)
-  [\*Universe Creation, Hypothesis of Continuous Cosmic Nebula\*](#)
-  [\*Circulating Sweepers\*](#)
-  [\*Pneumatic Petrous, Bilateral Temporal Hyperpneumatization\*](#)
-  [\*Ulnar Nerve, Congenital Bilateral Dislocation\*](#)
-  [\*Oocyogenesis\*](#)
-  [\*Spermatogenesis\*](#)
-  [\*This Woman Can Only Give Birth to Female Children\*](#)
-  [\*This Woman Can Only Give Birth to Male Children\*](#)
-  [\*This Woman Can Give Birth to Female Children More Than to Male Children\*](#)
-  [\*This Woman Can Give Birth to Male Children More Than to Female Children\*](#)
-  [\*This Woman Can Equally Give Birth to Male Children & to Female Children\*](#)
-  [\*Piriformis Muscle Injection\\_ Personal Approach\*](#)
-  [\*Eve Saved Human's Identity, Adam Ensured Human's Adaptation\*](#)
-  [\*Corona Virus \(Covid-19\): After Humiliation, Is Targeting Our Genes\*](#)
-  [\*Claw Hand Deformity \(Brand Operation\)\*](#)
-  [\*Corona Virus \(Covid-19\): After Humiliation, Is Targeting Our Genes\*](#)
-  [\*Barr Body; Mystery of Origin & Ignorance of Function\*](#)

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-  [\*Three Steps of Neural Conduction\*](#)
-  [\*The Iliopsoas Tendonitis... The Snapping Hip\*](#)
-  [\*Who Decides the Sex of Coming Baby?\*](#)
-  [\*Barr Body, The Whole Story \(Innovated\)\*](#)

***10/12/2017***