



A ONE - STEP MEIOSIS OF HUMAN CHROMOSOMES WITH REARRANGEMENT OF GENES, NO BREAKAGE AND NO CROSSING OVER OF CHROMATIDS.

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INTRODUCTION

For over a hundred years, the world had witnessed a huge number of discoveries and inventions by a number of great scientists of the world. These discoveries have changed the face of the world and pushed it forward, despite the meager possibilities compared to the current time. Recently the concepts of cytology and genetics were combined together to form the science of Cytogenetic, which is advancing at a tremendous rate and covers all the aspects of human being life. It has been known that meiosis encompasses a number of dynamic processes. The scientists have proposed a lot of conflicting theories, hypotheses and speculations for meiosis. Since the starting point of their studies, controversy and confusion accompanied the scientists and their explanations for meiotic process, because of: partly, of wrong observations – A good example was the mistake in counting chromosomes by painter in (1923), who was the responsible for the notice that the human chromosomes number is (48), a mistake that went uncorrected for the next 33 year. And partly due to difficulty in explaining this process, because it is linked to the creation of human being by the God, Who keeps it secret. The God says in the holy Qur'an: (I did not make them witness to the creation of the heavens and the earth or to the creation of themselves and I would not have taken the misguiders as assistants). (*Surah Alkahf, verse 51*). The other point in this concern is the prompt responses and acceptance, by other scientists to any new hypothesis even if it is illogic and contradicts the God's word. In this regard, the acceptance of (Breakage and reunion theory), the most famous theory which proposed by Darlington(1935) is another example of this unsuccessful acceptance. Although meiosis is not easy to make experiments, the scientists felt back on speculations but unfortunately most were not in a proper route. Einstein had said: (imagination is more important than knowledge). But, it must be in a right route and moment and on a sound base and place. In fact, while scientists studying meiosis, they had forgotten that the fruit fly (*Drosophila*), plants(onion), animals (rats, fish, frog ...etc.), are not human being or similar to it and the meiosis of *Drosophila* is not the meiosis of human being (man or woman). That is why whatever the scientists' s studies, certainly, they will never know the details of creation, because The GOD keeps the creation secret. So, what we are studying and seeing by our little science is the permissible zone given to us by the Lord. The GOD says in the holy Qur'an: (And they ask you, [O Muhammad], about the soul. Say, "The soul is of the affair of my Lord. And mankind have not been given of knowledge except a little).(*Surah- al-israa-verse85*). The God created Adam(the father) from the soil and created Eve (the mother) from Adam's rib. On this ground and for whom who believe and trust The God, I put my article for discussion. I just want to remind you with the moment of declaration Mapping of the human genetic code in the year 2001 and during Washington post live discussion, they asked Dr Scott: A philosopher and scientist once said " the more we learn, the less we realize that we know?.....etc. Randal Scott answered:who are we? Why are we here? Is there a God or did the genetic code arise by chance?. Can the spirit of humankind be defined?.....etc. of this meaningless answer.

Dr. Scott forgot that we have a cell theory had proposed by scientists. So, how could the people believe or trust your science and results if you deny the existence of their LORD ?. In the holy books of all religions no one ignore who is the creator ?. The interpretations of the theories by scientists, had felt in the circle of repetition and they have not jump to other zone and to stand up properly, because they have no new knowledge. Only they chewing the same old theories and information since a

century ago. All contemporary researches and publications are discussing the same theories, mostly they support them. The hot debate raised between scientists about which is the first chiasma or crossing over, had reminded me with The philosophers of Byzantium when they raised the hot debate about *which is the first the hen or the egg ? for long centuries* without answer. The Egyptian scholar Mohammed matwally Al-Sha'rawy answered this easily by reading a verse from

the holy Qur'an. Alsharawy had said: The God says: (And of all things We created two mates; perhaps you will remember). (*Surah: Althariat, verse*⁴⁹). Which means that all creatures are found in two mates: Human being, plant, animals, in two mates. So, basing on these facts there are paternal and maternal chromosomes i.e. there are male and female Chromosomes.

HISTORY AND BACKGROUND

Isaac Newton had said: If I have seen further it is by standing on the shoulders of giants. And I am ashamed not to mention the names of this long line of the great scientist and discoverers. The 19th century and the first half of 20th century, the world witnessed, a tremendous in development in scientific knowledge as a result of this huge number of discoveries. In this concern the first study of human chromosome was by Flemming in 1889, along with other work of other scientists led to understanding the behavior of chromosomes in mitosis and meiosis. Weismann in 1892 claimed that chromosomes were the physical basis of heredity. The principles of Mendelian inheritance 1901 with Sutton and Boveri reports about segregation of homologous chromosomes. Tjio and Levan 1956 established that the correct human diploid chromosome number is (46). Calvin Bridges and Thomas Hunt Morgan are credited with discovering nondisjunction in *Drosophila melanogaster* sex chromosomes in the spring of 1910, while working in the Zoological Laboratory of Columbia University. Discovery (1865), Heredity Transmitted in Units, by Gregor Mendel. Frederick Miescher (1869) isolates DNA from cells for the first time and calls it "nuclein. Botanists DeVries, Correns and von Tschermak, (1900) Rediscovery of Mendel's work. Discovery (1902) Chromosome Theory of Inheritance, Walter Sutton observed that the segregation of chromosomes during meiosis. Wilhelm Johannsen (1909) coins the word "gene" to describe the Mendelian unit of heredity. Thomas Hunt Morgan (1911) and his students, described Chromosomes Carry Genes. Discovery (1941): One Gene, One Enzyme Hypothesis, George Beadle and Edward Tatum. Discovery (1952): Genes Are Made of DNA, Alfred Hershey & Martha Chase. Discovery (1953): DNA Double Helix, Francis H. Crick and James D. Watson. Joe Hin Tjio (1955) defines 46 as the exact number of human chromosomes. Jerome Lejeune and his colleagues (1959) discover that Down Syndrome is caused by trisomy 21. There are three copies, rather than two, of chromosome 21 and this extra chromosomal material interferes with normal development. Discovery (1975) of DNA Sequencing by Two groups, Frederick Sanger and colleagues and Alan Maxam and Walter Gilbert. Strasburger (1875), First observed chromosome during cell division. Waldeyer (1888), Coined the term chromosome. Sutton and Boveri (1902), Proposed the chromosome theory of inheritance. Boveri (1932), described chromosomes as bearer of hereditary traits. Hundreds of discoveries and inventions during this long, continuous journey.

Some old proposed theories on meiosis

A number of theories have emerged from time to time attempting to explain the exact mechanism and had proposed by a number of scientist to solve and explain the meiotic process and its phases and events (crossing over, pairing, segregation, nondisjunction....etc.). Some of these theories were as follows:

1-Janssen's classical theory

In 1909 Janssen had believed that prior to the formation of chiasmata, the homologous maternal and paternal chromosomes come in pair and in pachytene stage they became coiled round each other and become double. Paternal and maternal chromatids made contact and one chromatid of chromosome penetrated that of the other, until they were broken where up on they rejoined in new way, forming the typical chiasma between them.

2-In 1931, J. Belling proposed "the copy choice theory"

The theory suggested that the paired chromosomes in the first meiotic prophase duplicates their genes and assumes that the crossing over is the direct result of the new chromatids. In this crossing over is the result of an exchange between new chromatids while they being synthesized. The hypothesis assumes that the chromosomes replication takes place during pachytene. The scientists criticized this theory because it was not satisfactory.

3-Breakage and reunion theory

C.D. Darlington in 1935 had proposed the hypothesis of mechanism of crossing over, which is called "breakage and reunion theory. He postulated that the homologous chromosomes are intertwined during the four stranded stage of the first meiosis. The twisting exerts strain(stress) on the chromatids, so the chromatids will be broken. Then the broken chromatids of one chromosome will unite with broken end of the other chromatid forming a chiasma. The break and reunion occur between non-sister chromatids and recombination would result. This theory is the more accepted explanation by scientists to date, to account for the formation of recombinant. New scientists believe that some enzymes are involved in the process of breakage and reunion. Many other theories were proposed for crossing over, some of them are: The classical theory by Karl Sax 1932 and sharp 1934, other scientists as: Muller, Serebrovsky, White and others. All theories were rotating around the same traditional concept.

What did scientists write about meiosis ?

According to their studies and theories they have defined a number of processes and events including the issue of discussion:

Meiosis:

The issue meiosis recently raised again. Meiosis was discovered and described for the first time in sea urchin eggs in 1876 by the German biologist Oscar Hertwig. It was described again in 1883, at the level of

chromosomes, by the Belgian zoologist Edouard Van Beneden, in *Ascaris* roundworm eggs. The significance of meiosis for reproduction and inheritance, however, was described only in 1890 by German biologist August Weismann, who noted that two cell divisions were necessary to transform one diploid cell into four haploid cells if the number of chromosomes had to be maintained. In 1911 the American geneticist Thomas Hunt Morgan detected crossovers in meiosis in the fruit fly *Drosophila melanogaster*, which helped to establish that genetic traits are transmitted on chromosomes.

The evolutionary origins of meiosis have been a matter of intense debate for decades and are intimately connected to the controversy about the biological value of sexual reproduction itself, which dates from the 19th century (Ghiselin 1988).

Meiosis is the process by which homologous chromosomes are separated to form gametes. Gametes contain only one member of each pair of chromosomes. Prior to meiosis, each chromosome is replicated. The replicas, called sister chromatids, remain joined together at the centromere. Thus, as a cell starts meiosis, each chromosome is composed of two chromatids and is paired with its homologue. The chromatids of two homologous chromosomes are called non-sister chromatids. Meiosis occurs in two stages, called meiosis I and II. Meiosis I separates homologues from each other. Meiosis II separates sister chromatids from each other.

According to scientists' theories, What does Crossing over mean?

Crossing over, or recombination, is the exchange of chromosome segments between non-sister chromatids in meiosis. Crossing over creates new combinations of genes in the gametes that are not found in either parent, contributing to genetic diversity. Several theories have been proposed to explain the mechanism of crossing over, nondisjunction in human chromosomal meiosis, but all were unsatisfactory.

According to scientists' proposals, what does nondisjunction mean?

Nondisjunction refers to a process that causes two homologous chromosomes to go to the same pole instead of segregation to opposite poles. It is the failure of homologous chromosomes or sister chromatids to separate properly during cell division. Finally scientists had stated: the biological mechanism of this phenomenon (nondisjunction) are not well understood.

DISCUSSION

there is Saying says : If you don't know, you don't see
During my brief review of literature in regard to meiosis process and its events, I found all theories and hypotheses were in the circle of controversy. There is nearly a consensus of scientists to accept all old theories. These theories were based on experiments and models on: Bacteria, plants, animals, fruit fly (*Drosophila*),

Ascaris... etc. But they had never mentioned human beings. The scientists have concluded - in most of their scientific works (researches) - that there is confusion, unsatisfactory explanations and there is insufficient knowledge for explaining the meiosis process. Because meiosis still in the circle of controversy and still unknown, The scientists have asked themselves with a number of questions, some of these questions are:

1-The origin of meiosis

In regard to this process (a two – step meiosis, scientists have stated:

a- We did not actually set out to study the initiation of meiosis.

b-The origins of meiosis in human chromosomes history have never been satisfactorily explained and has always been problematic.

c-The origin of meiosis process still unclear and vague.

d- About a one – step meiosis scientists reported (M. Archetti, 2004) that a one-step meiosis is uncertain, rare and it might be invaded and replaced by a sexual reproduction and it has no protection against invasion. I noticed that, scientists linked crossing over to all meiotic theories.

In fact, no scientist claimed that he had followed the meiotic process in human chromosomes thoroughly and watched it during all phases inside the nucleus, even with electron microscope.

2- The status of chromosomes inside the cell?

The scientists in their discussions have mentioned that they found chromosomes in pairing sets, while others mentioned that they found chromosomes in dispersed status in nuclear fluid. They had written chromosomes are dynamic biological objects that undergo large morphological changes during the cycle, therefore it is difficult to establish their nature. My opinion is that there is no pairing up for chromosomes sets that can occur; because it is impossible to occur in a fluid media, even if these chromosomes resemble small wooden sticks, It cannot logically be settled in one place. So, they would be found in dispersed status (scattered).

3-Is it necessary for the chromosomes to undergo a replication (duplication), before divisions?

Scientists stated that replication represents an important step in meiosis. But they have stated: the nature of human origin of replications still unclear. Some of scientists stated that there is no necessity for replication, but they did not explain why.

4- Does the chromosomes undergo: pairing (alignment), synapsis, Segregation?

All these terms (events) were mentioned by scientists after their experiments on plants and flies. One of researchers have stated: for over a century, scientists have strived to understand the mechanism that govern accurate segregation of chromosomes during meiosis but with no result. Other stated: There is no direct evidence

that human recombination to achieve synapsis during meiosis. (Roman and Camerini-Otero 2000). Other have written: we really have not had any idea how do chromosomes initiate synapse in *Drosophila*, although the origin of homologous synapsis can never be known with certainty. Finally they stated: we know that homologous chromosomes have to pair up during meiosis, but exactly how they do this remains a bit of a mystery.

5- Are there attraction and repulsion occurred between chromosomes, as the scientists have proposed?

The scientists have discussed these two terms and they have published researches and books about them. They have applied these two terms incorrectly, because they ignore the mechanism. In fact chromosomes recognize each other, but, no attraction and no repulsion. Repulsion and attraction occurs in charges as the American scientist Benjamin Franklin had discovered. Repulsion and attraction occur in the positive and negative charges in the electricity in clouds, but not in the living materials (chromosomes and chromatids).

6- Recognition

The scientists have repeated this question frequently: how do the maternal and paternal chromosomes recognize each other?. And their answer is: with unknown mechanism. Here I ask to remind all: when your superficial vessel is injured; What will happen?. The answer: physiologically, there is immediate response by blood cells, there is vascular constriction, there is formation of a platelet plug and blood clot. How could this occur? And how could these blood cells know the site of injury and arrive immediately. But the definite answer for this question - (how do chromosomes recognize each other?) -, is in these verses. Allah (The God) says: (Who created and proportioned²). (And Who destined and [then] guided³). (Surah Al-A' LA, verse 2-3). Also I ask: how could the chicks know the way of the field when they come out of the eggs after hatching them?. And how could the ducks know the way of the river?. And how the small turtles and the crocodiles know the way of the sea and the river?. The definite answer:

Allah (The God) says: (Who created and proportioned²). (And Who destined and [then] guided³). (Surah Al-A' LA, verses 2-3).

7- Is it true that there is no difference between paternal and maternal chromosomes (autosomes and sex chromosomes (paternal X and maternal X)?

The scientists emphasized that there is no difference between maternal and paternal autosomes and no differences between paternal X chromosome and maternal X chromosome. I ask all scientists: how are there no differences between male autosomes and female autosomes? and no differences between paternal X chromosome and maternal X chromosome?. While the God says: (And of all things We created two mates; perhaps you will remember). Surah: Althariat, verse:^[49]

Which means all creatures in mates, humans, animals, plants, except ALLAH. Allah says in the holy Qur'an: (Say, "He is Allah, [who is] One). Surah: Al-Ikhlâs.verse¹.

Absolutely, with no doubt, There are sex differences present between female autosomes and male autosomes. It is not a matter of chromosomes, if we could not differentiate between them, but it is our responsibility we have a little knowledge.

Allah says: (They ask thee concerning the Spirit (of inspiration). Say: "The Spirit (cometh) by command of my Lord: of knowledge it is only a little that is communicated to you) Al-Israa⁸⁵.

8-RANDOM

Always, I read the word or the term (RANDOM), since the years of my medical study and I had never felt convinced with this word at all. Random means: chosen without method, Without conscious decision, Unsystematic, unplanned, unorganized, out of control. But all these meanings or synonyms are not found in the system of the GOD. The God says: (Indeed, all things We created with predestination. (Surah the moon, Verse 49)).

IN 1959 Susumn Ohno showed that the two X chromosomes of mammalian were different. one appeared similar to the autosomes the other was condensed and heterochromatic. But Susumn had not clarify it or explain it with confidence. So the X inactivation, is not a random process, but it is a precise process(event), the paternal X chromosome only must be inactivated.

CONCLUSION

I suggest: a one-step meiosis with genes rearrangement of genes and no breakage and no crossing over. Because of: (breakage and reunion theory1-)

Why do I consider this theory unrealistic and illogic?.

According to Darlington's Breakage and reunion theory, the Crossing over in a two - step meiosis allows only half the chromatids (two) to recombine per crossing over, while the other two are not affected, having no exchange of segments and no diversity in their genes. As they proposed crossing over occurs at early prophase of meiosis after chromosomes have paired and between only two of the four chromatids at any one locus (bridges 1916), (Bridges and Anderson 1925). So, the possibility of crossing over and genetic exchange is 50% which is not consistent with the aim of the sexual production of this process and it does not fulfill the task of exchange genes. Darlington in his theory have supposed a violent mean (breakage) which must happen and repeat continuously in every cell cycle, in an unusual way and the mind cannot accept it. I was surprised on how were the scientists convinced with The (breakage and reunion theory)?. It is, illogic and impossible to occur theoretically or in vivo. Because it is impossible for this

microscopic organisms (chromosomes) to be broken intentionally and to come back to repair this (broken part) again. Who can tell me how many days this breakage would have in order to be healed?. As long as there was a breakage, which means that a violence had been applied to this site., leading to this breakage or fracture in this arm of the chromosome (amputation like process). Again why are there breakage and reunion as Darlington had proposed?. I think it is not a wise manner to break a living little creature (chromosome arm) and to repair it again. In the process of creation this takes place by the willing of the Lord not occurring by chemicals or environmental, or toxic factors?. The God says in holy Qur'an: (His command is only when He intends a thing that He says to it, "Be," and it is). Surah Yaseen. Verse⁸².

After their maturation with full size and shape and completed genetically, then recognition (not attraction) and mating meeting and genes rearrangement due to contact of their anterior surfaces, then separation (not repulsion).

2- A one - step meiosis, is a single division without prior replication producing two daughter cells (gametes) with haploid sets of chromosomes, the genes rearrangement is taking place including the whole chromosome which produces genetic diversity, not a segment only as in crossing over, there will be no two chromatids remain unaffected without genes exchange.

3- It is simple, logic and possible to occur.

4- I ask: Why are there a production of four daughter cells, every two are identical (2 Ys and 2 Xs)?. why not to be one Y chromosome and one X chromosome only?. which, logically and scientifically could be accepted. If they are identical (which is so), there is no need to be (2 Ys) and (2 Xs). If not identical, who can tell me the differences between them.

5- Because, no scientists can affirm that breakage and reunion occurs in such unknown and illogic mechanism and no one could affirm that this one - step meiosis may not occur.

I suggested this because all scientists theories were on the base of speculation and theoretical explanation. And because up to date no definite answer had answered meiosis and its origin. My suggestion in no way contradicts the previous theories, hypotheses, it unique never proposed before and it differs completely from traditional explanation. It is consistent with the known facts and never contradicts the God word and instructions.

SUMMARY

What are the new scientific ideas in my suggestion, which contradicts the old theories of meiosis?

Briefly my suggestion includes:

1- A one – step meiosis.

2- No replication and pairing up.

3- Rearrangement of genes with no breakage and no crossing over.

4- the genes rearrangement includes the whole chromosome, while crossing over only two chromatids, while the other two chromatids unaffected.

5- There is a complete contact between chromosomes with their anterior surfaces, for mating meeting, while the previous theory only in a segment.

6- It produces two daughter cells (gametes) only Y and X chromosomes. But not four haploid cells (Y, Y + X, X).

7- there are differences between female chromosomes and male chromosomes autosomes and differences between maternal X chromosome and paternal X chromosome.

8- The X inactivation is not random, but the paternal X chromosome is the inactivated chromosome.

9- There is no attraction and repulsion between chromosomes but, contact mating meeting and separation.

10- Meiosis is a secret process, what we are studying is in the permissible zone by the God.

Comment

The author believes that (nondisjunction) is not a correct term which represents this supposed event (which will not happen). Theoretically if there is join there will be disjoin after pairing synapse and crossing over. But if there is no join (junction) and no (crossing over); how can we call it : nondisjunction and the chromosome moves to the other cell. The scientists in need to revise their previous data again, basing on this new ideas and speculation, because what scientists have proposed from my point of view would be difficult to occur. Unfortunately some of the scientists believe each other more than believing God's instructions especially which is relevant to the creation and had mentioned in the holy texts. And they believe their poor and insufficient knowledge more than the holy books of the God. that is why the Korean scientist had claimed that he has cloned human embryo which was false claim. (please read): Othman alfleesy, human being cloning a false claim and a fabricated results, International Journal of Cell Science and Molecular Biology, volume 1, issue1, august 2016. Many of the thorny, complex and mysterious things in science cannot be solved by scientific experiments, if they are concealed by the God. Who could know what is the spirit?, Because the God keeps it secret. Allah says: (They ask thee concerning the Spirit (of inspiration). Say: "The Spirit (cometh) by command of my Lord: of knowledge it is only a little that is communicated to you) Al- Israa⁸⁵. So, If there is a contradiction between your results and the word of Qur'an, please revise again your results.

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