The DNA Structure in the Holy Scripture

{On the earth are signs for those of assured Faith, as also in your own selves: Will you not then see?}, *(Thariyat:20-21)*

Evidence of the chemical and the physical structure of the DNA are found in several verses in the Scripture. These verses describe the creation of man from viscous clay, chain of clay, soil, pottery-like clay, volcanic sharp stone and water. The DNA chemical composition such as, the four nucleobases T, C, G, A, and the nucleotides (nitrogen bases and deoxy ribose sugar and phosphate) are described in details. The DNA replication process is also described in a precise manner. The DNA physical form, such as the spiral, is also mentioned in some verses. In addition, the DNA helix is composed of Genes that consist of Exons and Introns. Exons express a protein or a useful product, while introns are breaks between Exons with no protein making function. Exons are like meaningful text while introns are like punctuation marks; they are important to understand the meaning of phrases. The Scripture is also composed of verses that are separated by stars. The stars are punctuation marks that are important to understand the meaning.

The golden question: Does the Scripture contain the encrypted genetic code for man?

There are many verses that provide a clear answer to this question:

{Read in the name of your Lord Who created. Created man from a leech. Read! And your Lord is Most Bountiful. He Who taught by the pen. Taught man that which he knew not.}*, (Al Alaq: 1-5)*

These verses provide an answer to whoever questions how man was created. It instructs the person to "Read" and it gives the preliminary answer that man was created from a thing called "Alaq" which can be described as "leeches". This root meaning of the word in the native language means "something that clings". This thing can mean sperm or clot. It can apply to either the male sperm or female ova. But the Scripture continues with another word "Read" and tells the person asking to seek the answer in science. The connection between the Scripture and science when it comes to man's creation is clear.

Other verses stress that point:

{The Most Compassionate, taught the Scripture, created man, taught him intellect}, (Rahman:1-4)

{We shall show them Our signs on the horizons and within themselves until it will be manifest unto them that it is the Truth. Is it not sufficient that your Lord is Witness over all things?}, *(Fussilat:53)*

Other verses in the Scripture challenge those who deny the existence of God or claim that another being or no being created man to come up with a book and scientific evidence to prove their point. God would have not laid down this challenge if he has not already provided the scientific evidence in his own book. The subject of the challenge is in Gods words:

{Say, 'Have you considered those you worship instead of God? Show me which portion of the earth they have created. Or do they own a share of the heavens? Bring me a scripture prior to this one, or some trace of knowledge, if you are truthful'.}, *(Ahkaf:4)*

The challenge is to create a living creature and place the scientific evidence in a book. **So obviously, God has already created man and provided him with the scientific evidence in the Scripture**.

{O people! A parable is presented, so listen to it: Those you invoke besides God will never create a fly, even if they banded together for that purpose. And if the fly steals anything from them, they cannot recover it from it. Weak are the pursuer and the pursued!}, (Al Hajj:73)

{Say, 'If mankind and jinn came together to produce the like of this Quran, they could never produce the like of it, even if they backed up one another'.}, (Al Israa:88)

These challenging verses additionally prove that there is a clear link between the Scripture and the science of creation. Whoever can produce such a book can also create a living being. The evidence for the creation of man is in the Scripture, the book of God.

{And say, 'Thanks to God; He will show you His signs, and you will recognize them. Your Lord is not heedless of what you do.'.}, (Al Naml:93)

The physical structure and chemical composition of the DNA in the Scripture will be discussed in some details as follows:

1 – The Physical form of the DNA in the Scripture

Deoxyribonucleic acid (DNA) is a molecule that encodes the genetic instructions used in the development and functioning of all known living organisms. DNA contains the genetic code of humans, which defines the variations in shape, color, health and personality .The discovery of the basic form of the nucleic acid DNA by scientists James Watson and Francis Crick in the middle of the 20th century, clarified how DNA stores and preserves the genetic information, and how to transfer them from one generation to another .The physical structure of DNA that is extracted in the lab is described as viscous thread. Under the electron microscope it looks like a double helix chain. Details are as follows:

- **Viscous DNA thread**

DNA strands can be extracted from any plant or animal cell or a human cell easily. One can extract the DNA by using simple chemicals such as soap, carbonates, alcohol, and can be done in the laboratory or even in the kitchen. The DNA extracted has a distinctive shape is like thick thread of high viscosity .

{Inquire of them, 'Are they more difficult to create, or the others We created?' We created them from viscous clay!}, *(Saffat -11)*

Fig.1:- DNA extraction

- **DNA chain**

{*Man We did create from a chain of clay}*, (Believers 12**)***

- **Tangled DNA threads**

Further investigation of the physical shape of DNA reveals that every cell in the body contains a nucleus and inside the nucleus there are several chains of nucleic acids (DNA) called chromosomes.

Chromosomes appear under the microscope as tangled threads exactly as the Scripture description. The verse also connects this small unit of tangled threads to the faculties of hearing and seeing in a clear signal that it contains the special programming for these senses.

{ *We created man out of a drop of intermingled threads so that We might try him, and We endowed him with hearing and sight.},* (*Man:* 2).

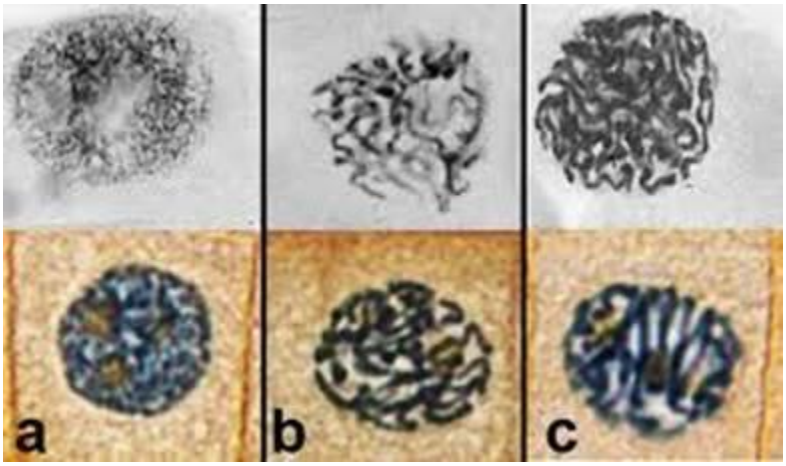

Fig.2: - Chromosomes as entangled threads in the cell nucleus

- **Spiral DNA Shape**

Science has proved that the genetic basis of cell division, growth and reproduction depends on splitting the double helix of DNA in the cell nucleus into two strands. During DNA replication, each individual strand is copied and forms a new double helix that migrates into a new cell. In this process all the genetic information of the creature are copied.

{It is God Who splits the grain and the seed. He brings the living from the dead, and He brings the dead from the living. Such is God. So how could you deluded?}, (cattle:95)

The Scripture have mentioned the molecular Physical form of DNA which is the **helix (or spiral)** discovered by scientists James Watson and Francis Crick . The verse that describes the helical or spiral shape as the basis for the beginning of creation is:

{On the Day when We fold the heaven, like the folding of a written scroll. Just as We began the first creation, We will repeat it—a promise binding on Us. We will act.}, *(Al Anbiaa:104)*

The basic spiral shape is not limited to the start of creation of the universe or its collapse but rather applies to the beginnings of all creatures and natural phenomena as well.

Rolling a scroll as mentioned in the verse result in a spiral form.

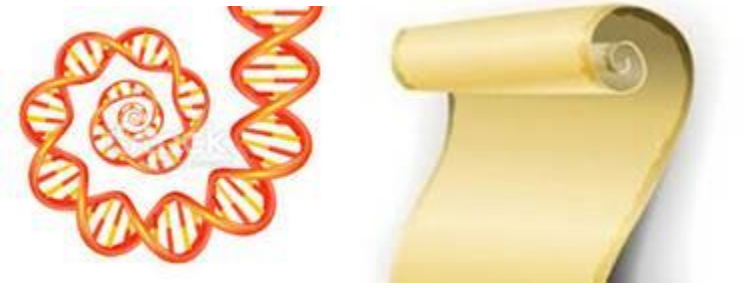

Fig.3:- Spiral shape of scroll and DNA

Fig.4 – Spiral shape of fetus and galaxy

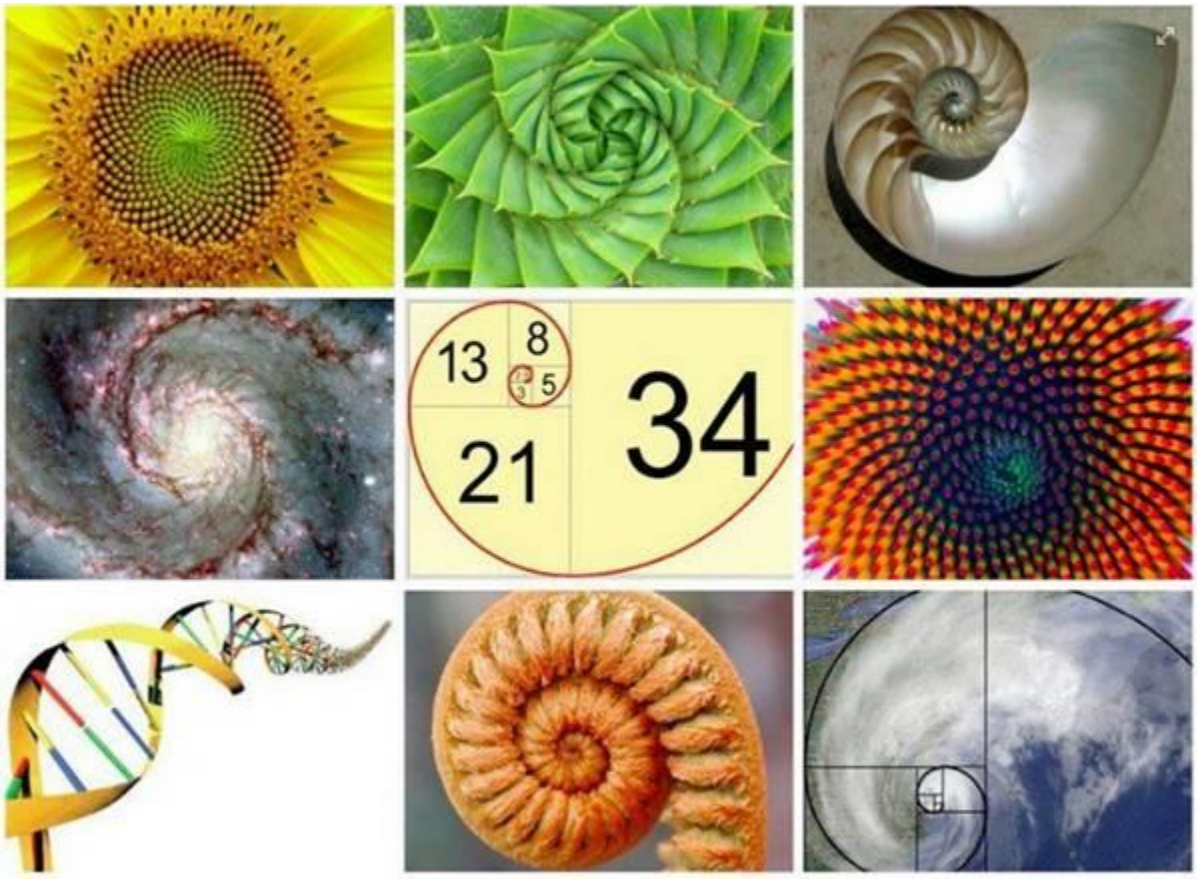

Fig. 5:- Spirals in Nature

- **Exons and Introns in Genes**

Several DNA double helix units are found in the living cell nucleus. These units are called chromosomes. Chromosomes are sub-divided into smaller units called Genes that consist of Exons and Introns. Exons express a protein or a useful product, while introns do not express proteins. Introns are breaks between exons. Exons are like meaningful text while introns are like punctuation marks; they are important to understand the meaning of phrases. The Scripture is also composed of verses that are separated by stars. The stars are punctuation marks that are important to understand the meaning.

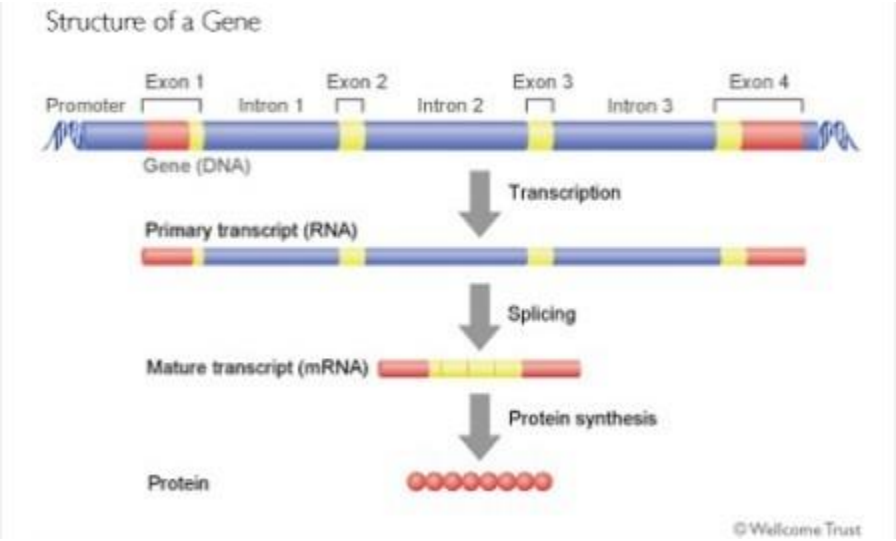

Fig. 6:- Exons and Introns in Genes

2- The Chemical structure of the DNA in the Scripture

Man is created from clay, which is soil that is mixed with water and this mix contains all the elements necessary for DNA synthesis such as carbon, hydrogen, oxygen, phosphate and nitrogen.

{He Who has perfected everything which He has created: and He began the creation of man from clay}, *(Sajdah :7)*

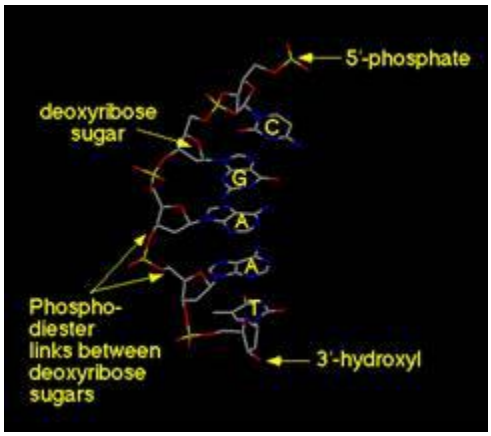

Fig.7 - chemicals in the double helix of DNA

{It is He Who has created man from water: then has He established relationships of lineage and marriage: for your Lord has power over all things}, *(Furqan:54)*

DNA contains the genetic code of humans, which defines the variations in shape, color, health and personality .The discovery of the basic form of the nucleic acid DNA by scientists James Watson and Francis Crick in the middle of the 20th century, clarified how DNA stores and preserves the genetic information, and how to transfer them from one generation to another.

DNA consists of series of chemical units called nucleotides. Nucleotides contain either a purine or a pyrimidine base. There are two purine bases adenine and guanine (A and G), while the pyrimidines are thymine and cytosine (T and C). The four bases are the building blocks of the DNA of every living thing.

The reference to the four bases are allegorically mentioned as "birds" in the scripture in the story of the Prophet Abraham who asked God to show him how to raise the dead.

{And when Abraham said, "My Lord, show me how You give life to the dead." He said, "Have you not believed?" He said, "Yes, but to put my heart at ease." He said, "Take four birds, and incline them to yourself, then place a part on each hill, then call to them, and they will come rushing to you. And know that God is Powerful and Wise."}, (2:260)

The “four bird” reference may have been a simplistic sign to Abraham but it is clear to us now that we know about the DNA structure.

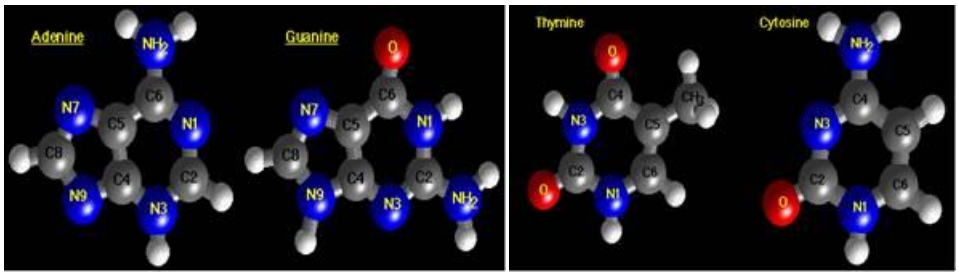

Fig.10 – Purines and Pyrimidine

The details of nucleotides are also mentioned in the scripture. Since every nucleotide consists of three main components: - sugar molecule (deoxy ribose), phosphate and nitrogenous base, the verses that describe them are as follows:

a- Phosphorus (P)

The Scripture describes the creation of man from a type of clay that resembles Potters-clay which has been made from sharp volcanic stone. It is known that in addition to phosphate being an essential component of DNA, c**alcium phosphate is the main component of bones in the human body and Apatite mineral.**

{He created man from sounding clay similar to pottery}, *(Rahman -15)*

{We created man from sounding clay from sharp heated stone}, *(Hijr-26)*

The Apatite ore containing calcium phosphate was deposited from volcanic rocks and the crystals that make up Apatite have sharp edges .This perfectly matches the description in the Scripture (sharp heated stone).

Fig.8 – Apatite Ore

Notice that the atomic number of phosphorus is 15 and these verses are mentioned in the Scripture chapter No. 15

b- Deoxy Ribose (C5H10O5)

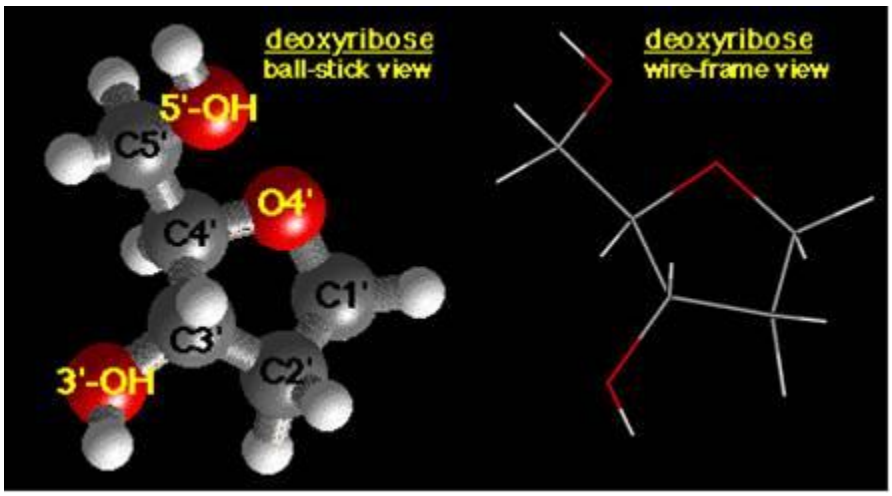

Fig.9 – Deoxyribose

Deoxy Ribose sugar contains five carbon atoms (C) (found in soil), ten hydrogen (H) and five oxygen (O) (from water). All organisms, including humans need chemical compounds that are based on carbon as their food sources. These ingredients are found in sugars from fruits and others .There are three consecutive verses that mention sugars in the Holy Scripture (chapter 16):

- Milk Sugar (Lactose)

{And there is a lesson for you in cattle: We give you a drink from their bellies, from between waste and blood, pure milk, good-tasting to the drinkers.}, *(Bees:66)*

- Fruit Sugar (Fructose)

{And from the fruits of date-palms and grapevines, you derive sugar and wholesome food. In this is a sign for people who understand.}, *(Bees:67)*

- Honey Sugar (Fructose and Glucose)

{And your Lord inspired the bee: 'Set up hives in the mountains, and in the trees, and in what they construct.' Then eat of all the fruits, and go along the pathways of your Lord, with precision. From their bellies emerges a fluid of diverse colors, containing healing for the people. Surely in this is a sign for people who reflect.}, *(Bees:68-69)*

In the DNA Deoxy Ribose is always chemically bonded to Phosphorus. Notice that these sugars are mentioned in Scripture chapter 16 (immediately after chapter 15 which mentions phosphorus).

c- Neucleobases (Nitrogenous alkaline bases)

Nitrogen is the basis of the alkaline Guanine, Adenine, Thymine, Cytosine (G, A, T, C) form the backbone of DNA double helix. These bases are arranged on the DNA double helix in pairs. A is always linked to T and C is always linked to G. Thus there are 4 pairs: AT, TA, CG, GC.

The source of these bases is the essential amino acids and secondary amino acids necessary for human life .Secondary Amino acids are synthesized in the human body but essential amino acids cannot and must be obtained from food sources, especially meat, as it contains all kinds of essential amino acids .(arginine, histidine, isoleucine, leucine, lysine, methionine, phenylalanine, Threonine, tryptophan, and valine) .

The importance of the essential amino acids found in meat from cattle for human food, especially at the stage of fetal development during pregnancy. The 4 pairs of cattle are surprisingly mentioned in the Scripture in the middle of a verse which describes the creation of man and the stages of pregnancy:

{He created you from one person, then made from it its mate, and brought down livestock for you—eight mates. He creates you in the wombs of your mothers, in successive formations, in a triple darkness. Such is God, your Lord. His is the kingdom. There is no god but Him. So what made you deviate?}, *(AlZomar: 6)*

The Scripture then categorizes the cattle in greater detail in another verse:

{Eight mates: two of the sheep, and two of the goats. Say, 'Did He forbid the two males, or the two females, or what the wombs of the two females contain? Inform me with knowledge, if you are truthful.'} *Anaam: 143*

{And two of the camels, and two of the cows. Say, 'Did He forbid the two males, or the two females, or what the wombs of the two females contain? Were you present when God enjoined this upon you?' Who does greater wrong than he who invents lies and attributes them to God, in order to mislead people without knowledge? God does not guide the oppressive people.}, *(Anaam: 144)*

The metaphors of the types (sheep, goats and camels and cow), is a coded reference to the 8 mates AT, TA, CG, GC. The Scripture code uses different cattle sizes as an "allegory".

Camel and cow are large: GC and CG

Sheep and goat are small: AT and TA

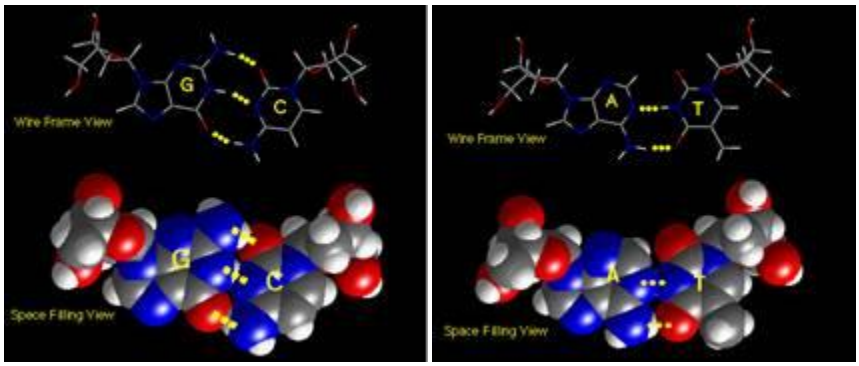

Fig.11 – CG and AT pairing

c- Organization of Nucleotides on the DNA double helix

The organization of the chemical units on the DNA is also described in the Scripture.

The code of combining the sugar ribose with nitrogen-bases C,G,A,T is reiterated in a series of verses by another allegory asking man to look for answers about his own creation in his food. These verses implies the sequence of phosphorus in grains then sugars found in grapes, dates and fruits then nucleobases from amino

acids found in olives, tubers (such as cucumbers and squash) and grasses then it mentions plants again and so on.

{Woe to man! How thankless he is! From what did He create him? From a drop He created him, and proportioned him. Then He eased the way for him. Then He puts him to death, and buries him. Then, when He wills, He will resurrect him. But no, until he fulfill what He has commanded him. Let man look at his food. We poured down water in a downpour. Then split the earth open. And grow in it grains. And grapes and tubers. Olives and dates, And luscious gardens. And fruits and grasses:}, *(Abs: 17-31)*

A simple way to visualize the DNA cross section as mentioned in the DNA and the Scripture is:

Phosphorus – Deoxy Ribose – Neucleobase ….. Neucleobase – Deoxy Ribose - Phosphorus

grain – sugar – protein ….. protein – sugar – plants

d- Amino Acids and the Genetic Code

Amino acids are the alphabet used by the DNA to make proteins. The DNA coding system reads every 3 nucleotides as a single codon (Amino acid) so a total of 20 Amino acids makes up the DNA alphabet. Amino acids are categorized into 5 main types: 1- Hydrophobic or nonpolar, 2- Acidic, 3- Hydrophilic or polar, 4- Basic and 5- Start or stop codons.

The metaphor of Amino acids is mentioned in the scripture: Chapter Al Naziaat verses 1-5

(1) By those who tend to drown, (2) And those who actively activate, (3) And those who swim a swimming, (4) And those who race the race, (5) And those who arrange an order.

3- DNA Replication

Living cell multiplication starts with DNA replication. The process of DNA replication proceeds as follows:-

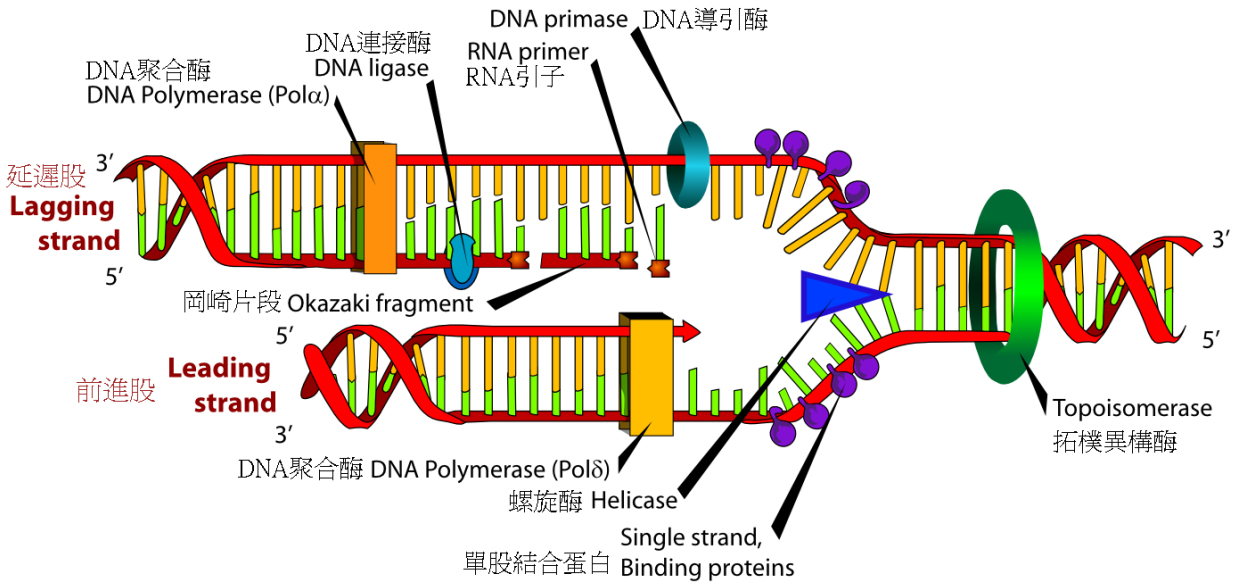

Fig.12:- DNA replication

DNA is composed of two strands and each strand of the original DNA molecule serves as template for the production of the complementary strand. Cellular proofreading and error-checking mechanisms ensure the accuracy for DNA replication. The nucleotides on a single strand can be used to reconstruct nucleotides on a newly synthesized partner strand using several proteins and enzymes that are recruited by the DNA replication system. DNA Replication proceeds in three enzymatically catalyzed and coordinated steps: initiation, elongation and termination. Initiators recruit proteins and form the pre-replication complex, which unzips the double-stranded DNA. The enzyme “Primase” synthesizes a short RNA primer which is subsequently elongated by the enzyme “Polymerase”.

In more details, the process starts with initiation. DNA “Gyrase” is an enzyme that temporarily breaks the strands of DNA, relieving the tension caused by unwinding the two strands of the DNA helix; then the two strands are separated by “Helicases”. The resulting structure has two branching "prongs", each one made up

of a single strand of DNA. These two strands serve as the template for the leading and lagging strands, “Primase” adds RNA primers to the template strands. The leading strand receives one RNA primer while the lagging strand receives several. The leading strand is continuously extended from the primer by a high processivity, replicative DNA polymerase, while the lagging strand is extended discontinuously from each primer, forming Okazaki fragments. “RNase” removes the primer RNA fragments, and a low processivity DNA polymerase distinct from the replicative polymerase enters to fill the gaps (Polymerases also perform proof-reading and error correction on both strands). When this is complete, a single nick on the leading strand and several nicks on the lagging strand can be found. “Ligase” works to fill these nicks in, thus completing the newly replicated DNA molecule.

The Scripture described the DNA replication process and enzymes in several verses:

{By those things that rank in ranks, and those that repel in repelling, and those that dictate a message}, *(Al saffat: 1-3)*

Explaining these verses from a biological (DNA replication) point of view makes sense when comparing the elements of the DNA replication system to the elements described in these verses. The “things that rank in ranks” is an allegory for the enzyme “Primase” and RNA primers that prepare the DNA strand for replication. The things that “repel a repelling” describe the proteins that repel the unwanted items that may interfere in the replication process. While the third verse, is a description of the “Polymerase enzyme”, which reads and inserts the nucleotides on the DNA strand.

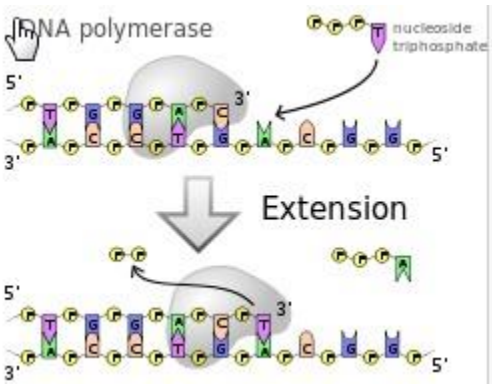

Fig.13:- Addition of Nucleotides to DNA

The Scripture has also addressed the DNA replication process in further details in these verses:

{By those (things) sent as a norm, and those that storm in storming, and those that saw a sawing, and those that split a splitting, and those that deliver a Message, whether of justification or of warning}, *(Al Mursalat: 1-6)*

The reference to those things "sent" to do a certain task is an allegory for the molecules sent by the DNA replication machinery to replicate the DNA double helix. There are two types of these molecules. The first is the standard type (the norm) whose job is well defined and straight forward. The second type consists of several small molecule that are fast and act as storm gusts. The things that "saw a sawing" describe enzymes that cut a large piece into smaller pieces like a saw (an allegory for the enzyme "Gyrase" that separate larger sections of the DNA helix into smaller sections. While those that "split a splitting" describe the "Helicase" enzyme that unwinds the DNA double helix and splits it into two strands. Then comes those that "deliver a message" to refer to the "Polymerase" that reads and insert nucleotides into each DNA strand. The message delivered by those things (Polymerase) are categorized in two types "Justification or warning" in a clear reference to the "correct" nucleotides inserted (justified) or "wrong" insertion "warning". (Errors in DNA replication can cause health risks, birth defects, etc…)

An observation is made here about the 3rd verse in the chapter "Al Saffat" and the 5th verse in the chapter "Al Mursalat". Both verses describe the same thing that "deliver or dictate a message" i.e the Polymerase that acts on the 3' and 5' positions on the DNA helix to read and deliver nucleotides.
