

BIOMEMETICS – THE SCIENCE OF LIFE

From physics and chemistry of the inanimate world to the province of life is an alien path. The contemporary situation in biology is far from satisfactory and opposed to observable facts. The current concept of “particulate gene” implies that genetic program is constituted by a chemical structure.

A gene in molecular terms is a DNA segment (protein-coding) and genome is the entire collection of genes encoded by an organism which in effect forms its genetic program. The view is now being modified to include the noncoding-DNA also, which has been until recently junk-DNA. It is known that biological function of the genome is to synthesize proteins and nothing more. The argument that genome constitutes the genetic program, however, not only provides the DNA molecule a multidimensional significance but also reiterates that the biological information is (coded) in the form of a chemical structure. It implies that millions of instructions and their sequences, which in fact form the genetic program, are the properties of (or coded in) a chemical structure. Although this is the currently accepted view based on which inheritance of characters and biological activities are explained, non-correspondence of genomic identity with genetic program is becoming increasingly evident from several investigations. The subject has been reviewed comprehensively elsewhere [1, 2]. It suffices to say here that particulate gene and genome concepts have miserably failed.

Rooh – The Biological Software

At various places the Quran uses the word *rooh* which can be interpreted as divine biological software. There are inconsistencies and variations in the interpretation of the word *rooh* by different Islamic scholars. A comparison of the translations given by A. Yusuf Ali, Pickthal, M.H. Shakir and Mohsin Khan [3] brings out important discrepancies.

A computer search for the word “spirit” (for *rooh*) in the Quranic translations yielded fifteen verses (4:171; 15:29; 16:2; 17:85; 19:17; 21:91; 32:9; 38:72; 40:15; 42:52; 58:22; 66:12; 70:4; 78:38; 97:4) in which *rooh* was mentioned. Of these, Yusuf Ali interprets the word as “spirit” in eleven verses (4:171; 15:29; 17:85; 21:91; 32:9; 38:72; 58:22; 66:12; 70:4; 78:38; 97:4), as Angel in one verse (19:17), and as “spirit of inspiration” or “inspiration” in the other three (16:2; 40:15; 42:52). Pickthal prefers to interpret it as “spirit” in all the verses except in one (42:52) where the phrase “Spirit of Our Command” is used. Shakir translates the word *rooh* as “spirit” in eight verses (4:171; 15:29; 19:17; 32:9; 38:72; 70:4; 78:38; 97:4), as “soul” in one verse (17:85), as “inspiration” in five verses (16:2; 21:91; 40:15; 58:22; 66:12) and as “inspired book” in one (42:52) while Mohsin Khan interprets it as “spirit” in two verses (4:171; 17:85), as “soul” in three verses (15:29; 32:9; 38:72), as Angel “Jibrael” in six verses (19:17; 21:91; 66:12; 70:4; 78:38; 97:4), as “inspiration” in three verses (16:2; 40:15; 42:52), and as “proofs, light, and true guidance” in one verse (58:22).

It is evident that uncertainties exist about the meaning of the term *rooh*. The given meanings “spirit”, “soul” and “inspiration” are therefore equally vague as they lack consistency and are shrouded in a mystic aura. Moreover unambiguous definitions do not exist for the given meanings also. Thus the interpretations do not offer a clear idea of the message conveyed through those Quranic verses. Use of different meanings for the same word with no apparent reason or explanation not only weakens the translations but also

occasionally gives rise to contradicting situations. For instance, there are four verses (16:2; 70:4; 78:38; 97:4) in which the words “Angel” and *rooh* appear together as “Angels and *rooh*”. If *rooh* is considered as Jibrael, it would result in the interpretation “Angels and Jibrael” literally implying that Jibrael is not an Angel. Further the interpretation also does not suit the contexts. It may also be noted that the meanings given to the word *rooh* such as “spirit”, “inspiration”, “soul” and “Jibrael” in the fifteen verses are not interchangeable. The prevailing situation suggests that there is no well-defined meaning or a broad consensus over the meaning of *rooh*. This is also true of the words given as meanings for *rooh*. Naturally all the interpretations became highly subjective depending on the view of the interpreter. With the current level of scientific knowledge, it is however possible to attempt the interpretation of the term *rooh* scientifically.

The word *rooh* may be best understood as the general term for divine bioprogram (biological software) for the following reasons. The word is invariably used in respect of living beings. The contexts include creation of Adam (A.S.), creation of Jesus (A.S.), strengthening of faith in human beings. In all these situations, it plays the role of biological software. Adam (A.S.) was created by Allah by breathing from His *rooh* into clay model (15:29; 32:9; 38:72).

“Behold! Your Lord said to the Angels: I am about to create man from sounding clay from mud moulded into shape. When I have fashioned him (first man, Adam) and breathed into him from My *rooh*, you (Angels) fall down in obeisance to him.” (Q. 15:28-29)

Allah breathed from His *rooh* into the clay model to create Adam (A.S.). It can be scientifically explained as creation of Adam by installing (breathing) the divine biological software (*rooh*) in the lifeless clay model to transform it into (living) Adam. As will be discussed in chapter 8, the term *nafs* is used in the Quran to describe specifically the *rooh* of a human being (Q. 39:6; 4:1).

Virgin Mary conceived Jesus (A.S.) from the *rooh* Allah sent into her (4:171; 19:17; 21:91; 66:12). The entire story of conceiving Jesus (A.S.) by Virgin Mary is narrated in the following Quranic verses (emphasis in bold face added).

“And (remember) her (virgin Mary) who guarded her chastity: We breathed into her from Our *rooh*, and We made her and her son a Sign for all peoples.” (Q. 21:91)
 “...We sent to her Our *rooh* (Angel) and **it (he)** appeared before her as a man in all respects. She said: I seek refuge from you to (God) Most Gracious. (come not near) if you fear God. **It (he)** said: I am only a messenger from your Lord to gift a holy son to you. She said: How shall I have a son, seeing that no man has touched me, and I am not unchaste. **It (he)** said: So (it will be) your Lord says: That is easy for Me, and (We wish) to appoint him as a Sign to men and a Mercy from Us. It is a matter decreed. So she conceived him (Jesus)...” (Q. 19:17-22)

The term *rooh* in these verses denotes the divine biological software responsible for the creation of Jesus Christ (A.S.). The conception of Jesus (A.S.) by Mary has been depicted

metaphorically. Yusuf Ali assumes that the word *rooh* indicates Angel and therefore wherever *rooh* is referred to in the verses above, the pronoun “he” was used by him. The proposed meaning “biological software”, warrants that the pronoun “he” be substituted with “it” as permitted by the Quranic message. The word used by him in the translation is indicated in parentheses in the verse. Mary being a virgin, only the egg (female gamete) with 22 autosomes and one X chromosome can be present in her womb. To produce a zygote that would develop into a male, Mary’s gamete has to fuse with a male gamete (sperm) carrying 22 autosomes and one Y chromosome. As such Mary can contribute only one (homologous) half of the program carried in 22 autosomes and one X chromosome. It lacked the other half – the male complement carried in 22 homologous chromosomes and one Y chromosome. Only if the program carried in this set of chromosomes with male element is made available, Mary’s gamete will be able to fuse with it and produce a son. It may be the homologous male part of the software (*rooh*) which is portrayed in the verse as the one that appeared before her as “man”. Alternately, it could also be the complete software Allah sent to her womb to create Jesus (A.S.). The Quran further informs us that the *rooh* entered her (Q. 66:12).

“And Mary the daughter of Imran, who guarded her **chastity**; and We breathed into (**her body**) of Our **Spirit**; and she testified to the truth of the words of her Lord and of His Revelations, and was one of the devout (servants).” (Q. 66:12)

This translation (emphasis added) given by Yusuf Ali does not corroborate the Arabic version on a word-to-word basis particularly in respect of “chastity” and “her body”. The resulting interpretation is far from presenting the full implication and semantic content of the verse. A more explicit translation (indicated in boldface) would read as follows:

“And Mary the daughter of Imran, who guarded her **genital organ**; and We breathed into **it (i.e., her genital organ) from Our *rooh***; and she testified to the truth of the words of her Lord and of His Revelations, and was one of the devout (servants).” (Q. 66:12)

The verse puts it bluntly and clearly that the *rooh* entered her genital indicating it is that *rooh* which produced Jesus Christ (A.S.). In other words it is the biological software of Jesus (A.S.) that went into Mary’s womb to create him. What is not clear is whether it formed the complete program of the Jesus Christ (A.S.) or just the male homologous portion. A couple of scenarios that would have led to the production of a zygote in Mary from the *rooh* can be thought of. If it is assumed that the *rooh* (software) that entered her genital represented the male (homologous) part of Jesus Christ’s software, it then got installed in the egg chromosomes as it did not come out of her. Mary’s egg thus got transformed into a zygote (2n condition) through synthesis of necessary chromosomes and other hardware required. The end product was a zygote with XY chromosome combination. The zygote carried the biological software of Jesus (A.S.). It is this software that would have created Jesus (A.S.). In this way the verses relating to creation of Jesus (A.S.) may be interpreted.

Although sex chromosomes XY make males generally, in extremely rare cases male can have XX combination also [4, 5]. This fact provides a still simpler scenario that would have led to the conception of Jesus (A.S.) by Virgin Mary. The *rooh* that is

supposed to have been installed in Mary's egg would have provided the needed biological information to transform it into a male embryo in XX condition following mitosis (to create 2n zygote). If that were the case the karyotype of Jesus (A.S.) would be similar to that of Mary. A third possibility is that the *rooh* that entered Mary's genital could be the complete software of Jesus (A.S.) which developed into foetus in Mary's womb. This appears to be the most likely mechanism of the creation of Jesus (A.S.) in view of the comparison of creation of Jesus (A.S.) with that of Adam (A.S.).

“The similitude of Jesus before Allah is as that of Adam; He created him from dust, then said to it: “Be” and he was.” (Q. 3:59)

As already seen, Adam (A.S.) was created by the *rooh* breathed into the clay mould (Q. 15:28-29) and Jesus (A.S.) was created by the *rooh* that entered Mary's genital. The verse 3:59 thus obviates the need of maternal contribution to the software of Jesus (A.S.). The *rooh* of Jesus (A.S.) is independent of Mary's software.

The interpretation of *rooh* as the biological software thus helps us to explain some of the otherwise unexplainable mysteries. At yet another place, the Quran makes a mention of giving life to a clay model of bird by *breathing* into it by Jesus (A.S.) as per the command of Allah.

“And (appoint him) an apostle to the Children of Israel, (with this message): I have come to you, with a Sign from your Lord, in that I make for you out of clay, as it were, the figure of a bird, and breathe into it, and it becomes a bird by Allah's leave...” (Q. 3:49)

In this verse (Q. 3:49), the act of breathing into the clay model of a bird was stated without mentioning what was breathed into. In the light of the earlier verses, it may be inferred that it was *rooh* that was breathed into the clay model to turn it into a living bird.

Jesus (A.S.) was endowed with several superhuman abilities. The speciality associated with his program is mentioned in the Quran as strengthening with *rooh-ul-khudus*, i.e., Angel Gabriel (Q. 2:87, 253; 5:110).

“Then God will say “Oh Jesus the son of Mary! Recount my favour to you and to your mother. Behold! I strengthened you with *rooh-ul-khudus* so that you did speak to the people in childhood and maturity. Behold! I taught you the Book of Wisdom, the Law and the Gospel. And behold! You make out of clay, as it were, the figure of a bird, by My permission, you breathe into it, and it becomes a bird by My permission; and you heal those born blind and the lepers by My permission; and behold! You bring forth the dead by My permission....” (Q. 5:110)

The superhuman feats shown by Jesus (A.S.) are divine actions. The support of Angel Gabriel given to Jesus (A.S.) by Allah may be construed as the reinforcement required for executing superhuman feats. *Rooh-ul-khudus* mentioned in this verse is Angel Gabriel (or Jibrael as some scholars spell the name) as can be inferred from the following verses.

“Say *rooh-ul-khudus* has brought the revelation from your Lord in Truth, in order to strengthen those who believe, and as a Guide and Glad Tidings to Muslims.”

(Q. 16:102)

“Say: Whoever is an enemy to Gabriel – for he brings it (revelation) to your *qalb* by Allah’s permission, a confirmation of what went before, and guidance and glad tidings for those who believe.”

(Q. 2:97)

The Quranic message 16:102 informs us that it is *rooh-ul-khudus* that brought revelation (the Quran) and the verse 2:97 mentions the name of the Angel as Gabriel who conveyed the Quran to the *qalb* of Prophet Muhammad (S.A.). Very clearly, the term *rooh-ul-khudus* is synonymous with Angel Gabriel. It should not be confused with *rooh*. The term *rooh-ul-ameen* is also used in the Quran (Q. 26:192-195) to refer to Angel Gabriel.

“Verily this is a Revelation from the Lord of the Worlds: With it came down *rooh-ul-ameen* to your *qalb* that you may admonish in perspicuous Arabic language.”

(Q. 26:192-195)

Mohsin Khan interpreted that way while other translators gave the meaning as “The Spirit of Faith and Truth” (Yusuf Ali), “True Spirit” (Pickthal) and “Faithful Spirit” (Shakir). The Quran is also referred to as *rooh* (Q. 42:52).

“And thus have We, by Our Command, sent *rooh* to you: you knew not (before) what was Revelation, and what was Faith; but We have made the (Quran) a Light, wherewith We guide such of Our servants as We will; and verily you dost guide (men) to the Straight Way.”

(Q. 42:52)

The Quran itself is divine software for human guidance, i.e., instructions to a biosystem (*rooh*). Besides the divine instructions, it also contains different kinds of information (knowledge) of historical and scientific nature, revelation about the future aspects of humanity, etc. The Quran in its original form exists as *al-lawh al-mahfuz* (Tablet Preserved) in an intangible form (Q. 85:21-22, see also chapter 4). It was in the *rooh* form the Quran was transmitted to Prophet Muhammad (S.A.). Once delivered in *rooh* form, Prophet Muhammad’s (S.A.) *qalb* retrieved the information in Arabic (see also chapter 11).

“Verily this is a Revelation from the Lord of the Worlds: With it came down *rooh-ul-ameen* to your *qalb* that you may admonish in perspicuous Arabic language.”

(Q. 26:192-195)

The word *rooh* is also used in yet another context in the Quran. In three verses (16:2; 40:15; 58:22), Allah informs us about sending *rooh* to prophets and other people whom He chooses to strengthen their faith (*eeman*). The Angel concerned brings it to the individual. The process of strengthening is also akin to installation of the required biological software (divine instructions) in those individuals to make their faith firm.

“He sends down His Angels with *rooh* by His command to such of His servants as He pleases,

(saying): Warn (man) that there is no God but I: so do your duty to Me.” (Q. 16:2)

“You will not find any people who believe in Allah and the Last Day, loving those who resist Allah and His Messenger, even though they were their fathers or their sons, or their brothers, or their kindred. For such He has written Faith in their hearts, and strengthened them with *rooh* from Himself. And He will admit them to Gardens beneath which Rivers flow, to dwell therein (for ever). Allah will be well pleased with them, and they with Him. They are the Party of Allah. Truly it is the Party of Allah that will achieve Felicity.” (Q. 58:22)

In four other verses the words *rooh* and “Angel” come together (16:2; 70:4; 78:38; 97:4) suggesting that *rooh* and “Angel” are distinctly different entities. In other words, *rooh* is not Angel; Angel has independent existence. This would mean that treating the word *rooh* synonymously with the word “Angel” as done by several translators of the Quran is not correct. The verses, however, suggest that the Angels can be carriers of the divine software for various tasks.

It is quite evident from the foregoing discussion that *rooh* is divine software consisting of Allah’s commands, instructions as well as other kinds of information. It can be the divine software to create a living being, instructions to guide human beings or to render one’s faith firm. All the situations where *rooh* is mentioned in the Quran involved sending (installing) Allah’s instructions (programs or other information) to a biological system. Therefore the Arabic word *rooh* used in the Quran may be interpreted as the general term for the divine biological software (the bioprogram). We cannot fathom the nature and form of *rooh*, the bioprogram (biological software). It is energy (*ghayb* form) with a language different from that of the abioprogram. As the Creator puts it:

“They ask you concerning the *rooh*. Say: The *rooh* (comes) by command of my Lord. Of knowledge it is only a little that is communicated to you, (Oh men!).”

(Q. 17:85)

Allah has not given us knowledge about the *rooh*. This verse thus makes it clear that *rooh* or the biological information is intangible form of energy.

From Genetics to Biomemetics

If we accept *rooh* as the intangible biological software (biological information), the current particulate view of the gene and genome as representing the genetic program of an organism is at variance with the Quran. The difficulties being faced with the physical gene concept in genetics and molecular biology may be attributed to this erroneous perception. It was Wilhelm Johannsen who introduced the notions of “genotype” and “phenotype” in 1911. In addition, for the elements of the genotype, he proposed the term “gene”. “He had...reservations with respect to its [gene’s] particulate character, and especially warned that the notion of “genes for a particular character” should always be used cautiously if not altogether be omitted” [6]. The gene remained a hypothetical entity till about 1950 which following the elucidation of chemical structure of DNA assumed particulate form. As we shall see, the non-particulate concept of biological information proposed by Johannsen is very close to the Quranic revelation.

Therefore scientifically, biological software may be treated as an intangible entity and not constituted by a chemical structure (*shahadat* form).

The non-particulate nature of the biological program raises the question as to how then it exists in the cell. It is supposed to exist as stored information on a storage medium in the cell [7, 8, 9, 1]. The programs and data we store in our computer memory do not form an integral part of the structure of the device but we are only exploiting the property (magnetic or other) of a chemical structure for storing information. Some cellular structure(s) must be having the property (derived from the abioprogram) of information storage and serves as the storage device of the cell. The most probable candidate for this device is chromosome. Chromosomes, the thread-like structures found in the cell may be considered as the storage medium as they are known to be the seat of hereditary information. However, it is not possible to say whether the whole structure or some part (including DNA) of it serves as the biomemory. *If information can be stored in brain cells independently of DNA base sequence, it must also be possible to store the biological software by a similar or a different mechanism in the cell.*

The adoption of the term “biomeme” to describe biological information helps to perceive biological software and other transmittable biological information as non-particulate or non-physical entity. The biological program at the level of the species is referred to here as “microbioprogram” and at the level of the individual as biomemome. The arrangement of biomemes on the chromosomes, i.e., biomemory organisation, is the “biomemogram” of a species (Fig. 1). Although we may get some broad idea of memetic allocation on the chromosomes (e.g., allelic loci) by studying the inheritance pattern of characters through breeding trials, it is not possible to map out the storage pattern on the biomemory. A memory sector on the chromosome may be storing one or more biomemes. A “biomemetic package” is a collection of biomemes constituting the program for a specific job or function. It is the totality of the biomemetic packages that makes the biomemome of the individual.

The various processes like cutting and splicing of chromosomal sector, deletion, replication, translocation, crossing over, etc. that lead to alteration or reorganization of the biomemogram constitute natural biosoftware engineering mechanisms by which biomemetic changes can be brought about. All these physical processes are biomemetically controlled and also result in the alteration of chromosome organization. There are also invisible (non-physical) changes that can create alteration in functional biomemes. The “switching on” and “switching off” of biomemes belong to this category. This is also a biosoftware engineering mechanism. Biomeme is the smallest unit of biological information that can be transmitted from parent to offspring. In terms of memory space it forms the smallest chromosomal part that can take part in natural software engineering processes.

An important feature of the biomemome is that it produces a dynamic phenotype that is changing continuously from time zero (the time at which say a zygote starts developing) to its death. The biomemome is thus an integrated program deciding the phenome (phenotype) at every instant. The biomemome, in simple terms, is an integrated biological program of an individual. Environment is not a decider of the phenotype. The biomemome is the sole decider of the kind of phenotype to be developed under different environmental conditions; i.e., the environment can induce modification of the phenotype

as stipulated in the program. In other words, the biomemome encompasses programs to modify or create phenotype depending on the environment.

Not all the biomemes carried in a biomemome are in operation at any given instant as in the case of instructions carried in our computer program. Only those biomemes required at that instant are in operation. The others are silent. The biomemes that are in operation at a given point of time or during a specified period may be collectively referred to as “operating biomemome” or “operamome” for short. A latent biomeme comes into operation at the time stipulated in the program (e.g., development of sexual characters at puberty) or when the situation (e.g., environmental stress) warrants. Thus we can say the biomemes in operation in summer are not the same as those operate in winter. If a person spends some time in a hot place and then enters an air-conditioned room, the operamome will also change accordingly as specified in the biomemome. The environmental conditions act as switches for the right biomemes to come into play. When an insecticide is sprayed against a pest in a crop field, and if the pest has the biomemetic package that can resist its harmful effect, the chemical will act as stimulus to turn on that software package which in turn will confer protection to the organism against that chemical. The consequence of this memetic operation is “resistance development” in the pest against that chemical. Although the biomemetic package is present in the organism all the while, it has not been in operation as the situation warranting its role has not arisen till then. Consequently, the cell may not be having the necessary hardware or it may have to modify some available hardware for execution of such rarely executed packages. Nevertheless when the situation arises for the biomemetic package to come into play, it requires the right hardware for its execution. Therefore the cell synthesizes the necessary hardware (any structure including DNA) or modifies the existing hardware according to the program to make way for the execution of the newly turned-on meme.

Development of resistance to pesticides in certain microorganisms [10], environmental stress-induced changes [11], changes in phenotype to suit the changing environment (e.g., beak development in finches) [12], etc. are examples of environment-induced biomemetic responses. In all these cases depending on the stimuli or signals received from the environment, specific biomemes are triggered into operation. Not all organisms will respond similarly to a given stress or environmental condition. An organism reacts to an environmental condition as directed by its biomemome. This would imply that all phenomic changes that occur in an organism are biomemome-directed phenomena *from within the cell* and *not externally induced* adaptations as is believed now. These are also instances of abioprogram-bioprogram interactions consistent with the divine control program. The availability of biomemes to counter environmental stresses including the kind of resistance development is a natural evidence of Allah’s designing the organism. Evolutionists’ explanation of adaptive changes based to DNA mutation caused by external factors is too naïve to account for the development of resistance to a chemical to which the species has never been exposed in its history on this planet. On the other hand the DNA mutation may be seen as the necessary hardware change required for the execution of the newly activated biosoftware package. Cell-induced DNA (hardware) changes observed in microorganisms under stress conditions [10, 11] support this biomeme-oriented explanation.

The development of an organism presents the scenario of large scale changes in operamome and cell hardware. Mitosis taking place during development changes the

operamome in the resulting daughter cells. Simultaneously the hardware of the cells also changes to suit the operamomes. The process is known as differentiation in developmental biology. This is how a muscle cell structure becomes different in its hardware (structures) and operation from a neuron. They both carry identical biomemomes but different operamomes. It also implies that the operamomes of any two cells in the body are not identical. That is to say even though all the cells carry the biomemome of the individual, the operamome will vary with cell.

Organism as natural biocomputer

An organism is a natural biocomputer or biorobot (particularly animals) whose development and functioning are determined by divine biosoftware. A cell, the basic unit of a living system, is a biochip (Fig. 5.2). The structures in the cell (organelles and nuclear structures including DNA) constitute the various hardware components. For example, the chromosome serves as the biomemory or the storage device of the biochip. Since these hardware components (chemical structures) are intended for the execution of the program, they are produced in the cell in accordance with the biomemome. A characteristic feature of the biocomputer is that there is anatomical hierarchy in the system hardware from the cell through tissue, organ and body system to finally the individual. All these hardware components are made of basically biochips. Thus a tissue is a collection of biochips with nearly homogeneous operamome, an organ is constituted by a combination of tissues, a body system (e.g., vascular system) by a group of organs and the individual is formed of a set of body systems. Every biological activity from the molecular level (inside the cell) to the level of the organism (individual) is treated in the NBC concept as programmed function.

Life, Death, Soul and Artificial Life

The Quran helps to develop life science based on memetic concept. The phenomena of life and death have hitherto remained unexplained in science. Although the whole biology is concerned with life and we are now searching for signs of life of the same kind we know of or of a different kind elsewhere on other planets, we have not defined the kind of life familiar to us. The difficulty associated with understanding and defining the phenomena of life and death is due to the erroneous linking of biological information with a chemical structure (genome). Physically and chemically a dead body is identical to what it was just prior to death. It has every atom in tact (including DNA) but yet it loses the life properties. Linking particulate gene to life is the fundamental flaw of biology shaking the very rationale of science. So long as scientists adhere to the particulate gene concept assuming that biological program is constituted by the DNA sequence, the phenomena of life and death will ever remain undefined and unexplained in science. These phenomena are not amenable to particulate gene concept but can be understood through biomemetics by treating the biological software as non-particulate (nonphysical) entity. The holy Quran offers sufficient clue to the nature of the phenomena of life and death based on which these phenomena can be defined elegantly consistent with the memetic concept.

“....At death, the Angels stretch forth their hands
(saying) “Yield up your *nafs*...” (Q. 6:93)

The Quran tells us that it is the removal of *nafs* (biomemome) that causes death. As already mentioned, *nafs* is the bioprogram (*rooh*) at the individual level. *Death can be therefore defined as the removal (deletion) of the nafs (biomemome) from the body cells.*

A dead body is like a computer without software. The body is no longer controlled by the biomemome and its structures can only show the properties governed by the abioprogram [8]. Consequently, it behaves like an inanimate matter. The Quran discusses death at another place thus:

“It is Allah Who takes *nafs* (of men) at death; and those that die not (He takes) during their sleep: those on whom He has passed the decree of death, He keeps back (from returning to life), but the rest He sends (to their bodies) for a term appointed. Verily in this are Signs for those who reflect.” (Q. 39:42)

This verse also informs that the *nafs* of a human being is removed from the body at death. It further says that Allah also takes the *nafs* during sleep and will not return it to the body whose death has been decreed; but *nafs* will be returned to the others for a pre-determined term till their death. In effect, the message implies that the *nafs* will be removed from the body only at the time of death. At all other times it resides in the body.

From these considerations, *the phenomenon of life may be defined as the manifestation of the execution of the biomemome.* This definition is derived from the relation between *nafs* and death given in the Quranic verse above (Q. 6:93). The terms “*nafs*” and “biomemome” are used in this book synonymously. Physiological, biochemical and other kinds of reactions and activities of the cell are thus the reflection of execution (information processing) of the biosoftware by cell hardware (including DNA).

“Soul” is another term that is used extensively in religious literature without a clear understanding. There is no consensus definition for “soul” and the word is used indiscriminately in varying contexts as evident from the translations of the Quran by different authors. As a result a lot of confusion exists in understanding the Quranic verses containing that word. Nevertheless as in the case of “life”, the term “soul” can be defined in computer parlance. Soul of a computer is its software, and hence human soul (*nafs*) can be treated synonymously with the biomemome of a human individual. The Quran thus defines the phenomena of life, death and soul in an elegant manner.

The computer model also confers ‘life’ to the so-called non-living systems. The inorganic universe is also a “living system” in its own right as it is also run on software – the divine abioprogram. In other words, the life of the so-called non-living system is of a different kind as its software is different from that of the biosystem. The life of the inorganic universe started with big bang (comparable to the zygote stage of a biosystem). These conclusions bring home the fact that in this universe itself there are at least two kinds of life. By extending the concept further to our computer systems operating on our programs, it is possible to define ‘artificial life’. Artificial life may be defined as the manifestation of the execution of a man-made program (software) [1]. Our computers, toys, robots and other systems that operate on software are varied forms of artificial life.

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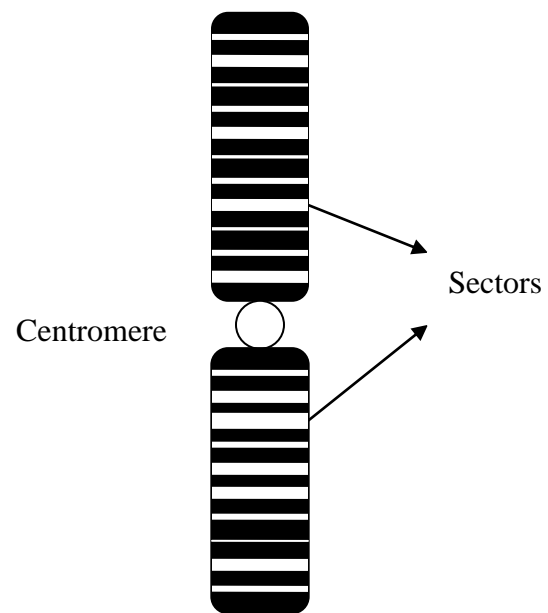


Fig. 1. Illustration of biomemory organization as sectors on a chromosome