

Storage of Information on Neuronal DNA; a Novel Logical Notion

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Man (Both man and woman) is the crown of God's creature. He has been given man the ability to acquire, retain and reproduce immense knowledge as has been well described in the final ever fresh and ever preserved divine book Quran.¹ This capability was demonstrated in front of the angels and then angels were ordered to prostrate in front of Adam. All angels did but the Satan who was although not an angel but used to spend time among them refused to do so. He was arrogant and asked permission from the God to allow him to make man go astray. The permission was granted as the God had given enough intellect and wisdom to man to stay away from being slave of the Satan.¹ Where that information of all things was stored in Adam's brain, is still a big question. An although we do have all that information, but we can't reproduce that, and we have to re-search that knowledge.

The question is still very valid where our brain stores all the knowledge and how our brain converts that knowledge into thoughts, ideas, speech and writing. Then of course neurons generate that knowledge and thoughts through chemical mediators and electrical impulses which are carried to various other neurons through axons via synapses. Almost all the work so far carried out is focused on the synapses and their plasticity. Short term and long-term memory are said to be dependent on this plasticity i.e. weakening or strengthening through repeated impulses or lack of impulses. Sleep seems to play very important role in coordination between hippocampus and cortex.^{2,3}

When hippocampus is relaying well organized and well categorized information to the neurons of the cerebral cortex, then this information which could be verbal, written or images etc. must be stored in some place. We here, to the best of our knowledge, for the first time present a novel notion that this enormous information is stored in the DNA of the neurons as DNA has the language and can transcribe or dictate and the message is then translated in the form of electrical signals or impulses. The DNA with the help

of "jumping genes" has enormous capability of editing including copying, pasting, deleting, inserting and modifying.

What some scientists describe rather very arrogantly as "genomic garbage" seems to the most probable place where this information is kept and **transposable elements (TEs)**, also known as "jumping genes" or **transposons** which roughly constitute about 50% the genome may play important role in regulation of this storage, transcription and translation; the newly formed chemicals generate electrical signals or impulses affecting synaptic plasticity.

DNA has the pen and the paper to write upon it and make figures. It has all the dexterity and diversity. With a few alphabets we can write all sorts of literature, poetry and scientific articles, while DNA has fewer alphabets but much more complex and comprehensive way of writing, modifying and adding emotions etc. It seems our impulses go through hippocampus which organizes these impulses and relay them to cerebral cortex for storing information into appropriate neurons. Hippocampus may generate new custom-made neurons.⁴

For example, if want to sing a song neuron via its DNA → RNA → Chemicals → electrical signals & action potentials pathways along with appropriate modifications by jumping genes can send these signals to the vocal cords, to produce, the best melodious songs or fiery speeches. "Most computational neuroscientists tend to estimate human storage capacity somewhere between 10 terabytes and 100 terabytes, though the full spectrum of guesses ranges from [1 terabyte](#) to [2.5 petabytes](#). (One terabyte is equal to about 1,000 gigabytes or about 1 million megabytes; a petabyte is about 1,000 terabytes.) The human brain contains [roughly 100 billion neurons](#). Each of these neurons seems capable of making around 1,000 connections, representing about 1,000 potential synapses.⁵ 100 billion neurons with immense mutational capacity with jumping genes can store enormous information; each neuron with 1000

synaptic connections can further modify the receiving and delivering information as well as stabilizing the information.

Synapses are made up of neural fibers with no DNA or RNA. The neural signals could be up or down regulated, but it is hard to believe that they have the means to store the information; synaptic plasticity however may play important role in modifying the tone, intensity and character of information in many other ways.

Normal individuals vary in terms of memorization; some individuals may have what we call "photogenic memory" e.g. great scholars of Hadiths (Sayings of the Prophet Muhammad peace be upon him) who could remember hundreds of thousands of Hadiths and could easily sort them out in no time. These Scholars of Hadiths included Muslim and Bukhari who founded the modern science of references which also included check on the integrity and authenticity of the persons relaying these saying not only in temporal and spatial context and orientation but as well as continuation of chain of transmitters.

Quran is quite voluminous book. From the time, Quran was revealed to the Prophet Muhammad (PBUH) till now hundreds of thousands of people memorize the Quran word by word, some of these are children as young as 5, 6 years old. Some memorize it in a few months while others may take little longer. We personally know many such individuals. There must be some affinity for storage of this copious information to reside in neurons. Not only the capability and capacity of neurons for storage but also the type of information and several other unknown factors may also be important in determining various aspects of memorization. The stability of the information e.g. long-term memorization may be perhaps enhanced through synaptic plasticity.

Is such enormous information being present in all other cells of our body as well? We don't know the answer, but it is certainly possible. The other tissues however do not have myriads of axons, dendrites and synapses. Quran, however, points out that in Hereafter our skin will give evidence against us; it will speak.⁶ Prophet David (Dawood) and his son Prophet Salmon (Suliman) (PBUT) had the ability to communicate with birds. Suliman (PBUH) even understood the speech of ants. Mountains sung praises of the God all mighty with the Prophet David (Dawood) (PBUH).⁷ We simply have no knowledge how mountains sing and how ants talk.

A person not believing in the God all Mighty may reject all these references, but please let me say clearly when we don't know, we must admit that we don't know, rather than labelling things as "garbage" etc. For centuries we did not know the functions of Organ of Gallen i.e. spleen and still we don't know all its functions as Galen had rightly called "Spleen; an organ full of mystery" but we now know some of its functions in terms of prevention of overwhelming septicemia.

We do not consider not believing in God as "science". We must realize our own shortcomings. In many senses human beings are even less capable than some animals. What can we hear and see is very limited. Our knowledge is vastly small compared to our Creator; as little water on the beak of a bird compared to all the oceans. As Quran and bible say that if all the oceans were ink and all the trees were made into pen, the ink will finish but things about our Lord will not.⁸

Purpose of this editorial is not to preach Islam, Quran or bible, but to bring attention to the scientific community to explore real likelihood of information being stored in our neuronal DNA rather than in synapses. If one says that some other less complex creatures e.g. onions may have more DNA or genomic material than human beings and hence a lot of genes are just useless, we will simply reply that we do not have enough knowledge to comment or answer. Realizing our limitation is science while making tall claims without enough knowledge could be anything but the science.

References

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