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Review Article

Biological Significance Kissing in the Light of Modern Achievements of Genetics

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Abstract

This scientific article presents the meaning of kisses in the light of new advances in genetics and cell biology. According to our new biological theories (viral theories, a nano-model theory of the functioning of the genome) the exchange of biological (genetic) information occurs mainly due to the exchange of mobile genetic elements, including with the help of bio communicators.

Keywords: Kiss; Genetics; Bio Communicators; Viral Theories; Nano-Model Genetic Theory

Introduction

A kiss is the most common way to express affection (and not just romantic). Perhaps this is why setting world records for kisses on Valentine's Day has become as good a tradition as sending "valentines" to those we value and love. The longest kiss to date has lasted 33 hours, the largest one included 39,897 simultaneous kisses, and the fastest - 112 kisses received in one minute.

Moreover, one cannot speak of a kiss as an exclusively cultural tradition, common only in a certain part of the globe. This way of expressing feelings is characteristic of 90% of the world's population, the remaining 10% replace this practice with something similar.

The question remains open: why do we kiss? Scientists say this is an evolutionary partner assessment tool for creating strong offspring. But not only.

A kiss suggests that people are very close to each other. This means that they have the opportunity to evaluate the smell and, in a sense, the "taste" of the partner, determining whether this person is suitable for procreation. The breath and saliva of people contain chemical signals about whether they are healthy or sick, and in the case of women, information about ovulation, and all this is extremely important for reproduction.

In addition, the skin around the nose and mouth is rich in sebum, an oily substance that functions as a natural moisturizer. Studies show that sebum contains pheromones - chemicals that transmit information about the biological composition of a person. When people collect each other's pheromones during a kiss, they subconsciously become more or less sexually interesting to each other (depending on whether the proposed composition of pheromones suits them). Scientists have found that we prefer pheromones of people with a different type of immune system. This is thought to be because a similar genetic difference improves the health and vitality of the offspring. However, in this scientific article, we will present the meaning of kisses in the light of new advances in genetics and cell biology. And according to our new biological theories [11,13,16,17] the exchange of biological (genetic) information occurs mainly due to the exchange of mobile genetic elements (including using bio communicators).

Scientists are sure that regular kisses help couples increase their sense of affection for each other. This theory is supported by the fact that the level of oxytocin (the hormone responsible for the feeling of attachment between people) in the brain increases significantly during a kiss. The same can explain why people constantly kiss during sex with a loved one, but almost do not do it during "random" sex.

To fully understand the significance of a kiss, you need to become familiar with viral theories, with a nano-mock genetic theory and with a new classification of the genome. This is important for a correct understanding of the formation of higher nervous activity of a person and the consequences arising from this.

Viral theories

As a result of scientific meta-analysis, the viral theories presented in Table 1 were created [11,17].

It is known that viruses are one of the greatest mysteries of modern biology. According to modern concepts, a virus (lat. Virus - poison) is a non-cellular infectious agent that can be reproduced only inside living cells. Viruses infect all types of organisms, from plants and animals to bacteria and archaea [1,6,9]. Viruses are found in almost every ecosystem on Earth, they are the most numerous biological form. Viruses are obligate parasites, as they are not able to multiply outside the cell [20].

However, given the current level of knowledge in various fields of science, there is an urgent need to review some fundamental ideas about the true role and place of viruses in nature. For this, a meta-analysis of various reliable scientific data was performed, starting mainly from 1892 [17].

The virus was first proved in 1892 by the Russian scientist D. Ivanovsky. After many years of research on tobacco plant diseases, D. Ivanovsky concludes that tobacco mosaic disease is caused by "bacteria passing through the bacteriological filter, which, however, are not able to grow on artificial substrates". Five years later, when studying diseases of cattle, namely, foot and mouth disease, a similar filtered microorganism was isolated. And in 1898, when reproducing the experiments of D. Ivanovsky by the Dutch botanist M. Beyerink, he called such microorganisms "filtering viruses." In abbreviated form, this name began to denote this group of microorganisms.

If you understand the true place and functions of viruses in nature, then using their example it will be possible to study the fundamental foundations of life and its manifestations.

So, we have formulated 13 new viral theories, each of which reveals one of the functions of viruses in nature (Table 1). However, in this scientific article we will not dwell on their description in detail. To get acquainted with viral theories, see our previous publications [11,13,17], special attention should be paid to the following 4 viral theories:

1.	The Viral Theory of The Electromagnetic Reception
2.	The Viral Theory of Biocommunication
3.	The Viral Theory of Signal Transduction
4.	The Viral Theory of Functioning of The Energy System of Cell
5.	The Viral Theory of The Functioning of The Immune System
6.	The Viral Theory of Perception of Information
7.	The Viral Theory of Memory Formation
8.	The Viral Theory of The Functioning of The Somatic Nervous System
9.	The Viral Theory of The Functioning of The Autonomic Nervous System
10.	The Viral Theory of The Functioning of The Endocrine System
11.	The Viral Theory of The Functioning of The Cardiovascular System
12.	The Viral Theory of The Functioning of The Reproductive System
13.	The Viral Theory of Evolution of The Organic World and Homo Sapiens

Table 1: Viral theories.

1. The Viral Theory of Perception of Information.
2. The Viral Theory of Memory Formation.
3. The Viral Theory of The Functioning of The Somatic Nervous System.
4. The Viral Theory of The Functioning of The Autonomic Nervous System.

In our previous published works [11,13] we concluded that viruses are migrating organelles of cells. They are actually part of us – cellular life forms and perform numerous functions. Viruses are not independent life forms and this is evidenced by cell theory.

In 1898, when reproducing the experiments of D. Ivanovsky, the Dutch botanist M. Beyerink actually introduced the term "virus", since he called such microorganisms "filtering viruses". In 2018, after 120 years [17], based on the foregoing, we proposed replacing the term "virus" with the term bio communicator, which certainly corresponds more to their functions.

Modern classification of the genome and the new genetic theory

Main and acquired genome

Genome – a set of hereditary material enclosed in the cell of the body. The genome contains biological information necessary for

building and maintaining the body. Most genomes, including the human genome and the genomes of all other cellular life forms, are built from DNA. There is also another definition of the term "genome", in which the genome is understood as the totality of the genetic material of a haploid set of chromosomes of a given species [3,21].

The main genome is the totality of all genes received by the body from the egg and sperm as a result of fertilization (nuclear, mitochondrial, plastid). This is a vertical gene transfer [16].

The acquired genome is the totality of all genes received by the body during the embryonic and postembryonic periods from migrating organelles of cells (bio communicators) in the form of DNA and RNA molecules. It is important to note that the acquired genome can also be formed on the basis of available genes (bio communicators) under the influence, for example, of electrical processes in the nervous system of the body (see viral theories of information perception, memory formation and functioning of the nervous system) [17]. Which occur as a result of the activity of the sensory systems of the body. The formation of the acquired genome is also influenced by electromagnetic radiation (for example, the ultraviolet radiation spectrum) of natural and artificial origin. In fact, it turns out that all changes occurring in the external and internal environment of the body are fixed (cause changes) in the acquired genome. Those that are significant are stored in the reserves of the long-term memory of the body. This is horizontal gene transfer [17]. The acquired genome is individual for each somatic cell. If the process takes place in gametes, then end virus genes can form, which is known to be inherited from generation to generation.

The role of bio communicators in unicellular prokaryotic organisms (for example, bacteria) is played by plasmids. However, they are not able to perform all the functions inherent in bio communicators. Plasmids carry out active horizontal gene transfer in prokaryotes. Analogues of plasmids for eukaryotes are viruses. Bacteriophages (bacterial viruses) are not bio communicators (migratory organelles) of bacterial cells, and this is indicated by the fact that they forcibly introduce their genetic material into the bacterial cell. Thus, bacteriophages are bio communicators of various eukaryotic cells (their migrating organelles), which carry out and ensure the regulation of various biochemical processes in bacterial cells and their numbers (from the side of the owner of this bio communicator).

According to the above information about the acquired and main genomes, a new definition of the term "phenotype" can be given. The phenotype is a manifestation of the totality of genes obtained by vertical and horizontal channels of gene transfer and the result of their interaction. Therefore, the phenotype is the expression (manifestation) of the genotype.

The body throughout life - from the moment of fertilization of the egg (the formation of the zygote) to death, has the opportunity to enrich its genotype due to an increase in the share of the acquired genome. This is accomplished by horizontal gene transfer. Information received by the sensor systems (receptors) of the body about the external and internal environment actively affects the change (enrichment or depletion) of the acquired genome of the body. As a result, the phenotype changes. However, these changes affect only the genes of certain cells of certain body tissues. For example, cells of the central nervous system of humans or animals, the immune system, or liver cells change. If changes affect the germ cells, then new signs and properties will begin to be inherited, from generation to generation.

Thus, taking into account our classification of the genome as the main and acquired, it is possible to achieve a complete understanding of various biological processes occurring at the genetic, cellular (biochemistry) and organismic (physiology) levels of organization, normally and with various pathologies [16].

Plasticity of the brain and plasticity of the genome

According to the foregoing, the body's genome is an actively and dynamically developing system throughout the entire period of ontogenesis, but to make this thesis more convincing, we give below an analogy with the plasticity of the human brain.

Neuroplasticity is a property of the human brain, which consists in the ability to change under the influence of experience, as well as restore lost connections after damage or as a response to external influences. Previously, it was generally accepted that the structure of the brain remains unchanged after it is formed in childhood [8,19].

The discovery of the fact that thoughts are capable, even in old age, of changing the structure and functions of the brain, is a major achievement in the field of neurology over the past four centuries. Norman Dodge offers a revolutionary view of the human brain [7].

The brain consists of interconnected nerve cells (neurons) and glia cells. The learning process can occur by changing the strength of the bonds between neurons, the emergence or destruction of bonds, as well as the process of neurogenesis. Neuroplasticity refers to the processes of the emergence / destruction of bonds and neurogenesis [8,19].

During the 20th century, it was generally accepted that the structure of the brain stem and neocortex remains unchanged after completion of formation in childhood. This meant that the learning processes there can proceed only by changing the strength of the bonds, while the areas responsible for the memory processes (hippocampus and dentate gyrus) and preserving the ability to neurogenesis throughout life are highly plastic. This view is changing under the influence of new research, which claims that the brain retains its plasticity even after childhood.

Neuroplasticity can manifest itself at different levels, starting with cellular changes in the brain, up to large-scale changes with reassignment of roles in the cerebral cortex, as a response to damage to specific departments. The role of neuroplasticity is widely recognized by modern medicine, and also as a phenomenon used in the development of memory, learning, and restoration of a damaged brain.

The idea of "plasticity" of the brain was first proposed by William James in 1890, but it was not given any significance over the next fifty years.

One of the fundamental principles of neuroplasticity is the phenomenon of synaptic pruning: the process of destruction and creation of connections between neurons is constantly going on in the brain.

Thus, scientists are a little late, but still came to the conclusion about the existence of neuroplasticity in nature. Why not accept the fact about the plasticity of the genome (processes of genesis / destruction of genes in the process of ontogenesis of the body) and with the help of such an understanding of fundamental biological processes explain the numerous processes that occur in nature and are the "mysteries" of science.

Nano-model theory of the functioning of the genome

According to our nano-model theory of the functioning of the genome, a DNA molecule stores biological information not only in the form of a genetic code consisting of a sequence of nucleotides, but also in the form of a spatial-structural organization. This means that the information component lies not only in the primary structure of the organization of DNA molecules, but also in structures II and III. These are actually peculiar biological nano-models [11]. RNA molecules can perform a similar function in nature, as well as protein molecules to some extent [13].

DNA contains information on the structure of various types of RNA and proteins [2]. But this does not mean at all that the DNA molecule does not have the ability to independently carry out numerous biological functions that ensure the vital activity of living systems.

Almost all genes function on the principle of nano-models. However, based on the fact that many genes of the main genome are localized in the cell nucleus and must function in the cytoplasm or outside the cell, therefore, nature has created transcription and translation processes known to modern biology. A protein has a three-dimensional structure (a certain shape) due to its II, III, and sometimes even IV structure. It is known, for example, that a protein-enzyme has an active center, functioning on the principle of a key to a castle. Depending on its form, it will have a certain functional activity. A DNA molecule (its specific part is a gene) also has a II, and III structure, that is, it is not just a linear molecule consisting of nucleotides [2,5].

The whole point of transcription and translation processes is to create a copy of nano-models (DNA gene) in the form of ribosomal RNA (r-RNA), transport RNA (t-RNA) or messenger RNA (m-RMK). In the case of m-RNA, the biosynthesis of the polypeptide chain (the primary structure of the protein) follows - translation on poly-ribosomes in the cell cytoplasm. In fact, ready-made copies of nano-DNA models capable of functioning outside the cell nucleus of a eukaryotic cell are provided. Protein biosynthesis is carried out as is known on the basis of m-RNA information; r-RNAs are part of ribosomes that are actively involved in the biosynthesis of proteins (primary structure); and t-RNA is necessary for the delivery of amino acids to the site of protein synthesis. Many genes are composed of exons -coding regions and introns - non-coding regions. During transcription from the gene, RNA is read that carries both exons and introns. During splicing, introns are excised, and exons cross-link and form mature m-RNA. Further, the protein polypeptide chain synthesized during translation will acquire a spatial-structural organization and become a functional product (protein) in terms of functionality.

Thus, here in a simplified form, the process of generating copies of nano-models based on biological information embedded in the DNA of genes is presented.

And part of the genes (mainly "garbage genes" and part of the genes of the acquired genome) do not need such intermediary processes, therefore, there is no need for transcription, translation. Because these genes must function either in the place of their localization (regulatory genes, for example), or they have the ability to leave the cell nucleus and cells. This applies to bio communicators (containing DNA and RNA). They for effective functioning and transportation are covered with a protein shell - a capsid. Along with bio communicators, there are transposons. Transposons are parts of the DNA of organisms that are capable of movement (transposition) and reproduction within the genome. Transposons are also known as "jumping genes" and are examples of mobile genetic elements.

That is why the vast majority of the human genome is non-coding protein. This is essentially a "gene language."

The molecular basis of epigenetics is quite complex, despite the fact that it does not affect the primary structure of DNA, but changes the activity of certain genes. This explains why in the differentiated cells of a multicellular organism only genes necessary for their specific activity are expressed. A feature of epigenetic changes is that they persist during cell division. It is known that most epigenetic changes occur only within the life of one organism. At the same time, if a change in DNA occurred in the sperm or egg, then some epigenetic manifestations can be transmitted from one generation to another.

Our nano-model theory of the functioning of the genome perfectly reflects the numerous processes taking place both at the cellular and organismic levels. Genes that function on the principle of nano-models are actually a kind of copy of the macrocosm. Depending on the adequacy of the reflection of the macrocosm at the cellular level, one can judge the level of quality of perception of information by the body. The well-known expression: "The brain is in the World, and the World is in the Brain", becomes fully explainable thanks to the above scientific data.

Cell differentiation in multicellular organisms: the formation of higher nervous activity in humans

Given that the body (cell) has a basic and acquired genome, this fact sheds light on many currently unresolved scientific issues and primarily on aspects of the genetic level of the organism. In turn, it becomes clear how and by what molecular mechanisms differentiation of cells in multicellular organisms is carried out in the process of individual development (ontogenesis). It is scientifically fully justified, for example, the appearance of highly specialized functions in neurons of the human brain and the manifestation of various functions of higher nervous activity already at the organism level.

Therefore, it is not surprising that geneticists studying the human genome are struggling to find those genetic features that led to an increase in the brain and, possibly, its more efficient work. Particular hopes are placed on comparing the human genome with the chimpanzee genome. This allows us to immediately exclude from consideration those 98% of the genome that are identical in our species. Somewhere there, in the remaining two percent, the secret of human uniqueness is encrypted. It remains to understand exactly where and how.

Immediately after reading the chimpanzee genome, genetics in close ranks rushed to storm the "eternal secret" of human uniqueness. Publications devoted to identifying the unique genetic characteristics of Homo sapiens are appearing more often, and it seems that a little more - and something very important will be revealed to us. And in fact, the biological theories we have proposed today are capable of explaining all this scientifically.

Human behavior and mental abilities are on a qualitatively new level compared to monkeys. It is reasonable to assume that these differences are of a genetic nature.

As a result of serious research, scientists proved that at the origin of man there was no universal and large-scale accumulation of amino acid changes in the genes involved in the work of nervous tissue [4,18].

But we are nevertheless smarter than chimpanzees and the relative size of the brain is larger! "Apparently, the development of our mental abilities is encoded by a very small number of genes (changes in their sequence or expression level), and these changes do not affect the average characteristics for all genes of the nervous system" [4,18]. These findings came to these researchers.

And according to our classification of the genome into the main and acquired (based on our viral theories) and nano-mock theory of the functioning of the genome, all this can be explained very logically and scientifically. The fact is that modern classical genetics study only the main genome of the body, that is, genes obtained from parent germ cells (egg and sperm). However, for the functioning of highly specialized cells (such as, for example, brain neurons) – those genes that were obtained from parents by vertical transmission (from germ cells as a result of the formation of a

zygote) will not be enough. According to our viral theories, for the full perception of information, the formation of long-term memory and the functioning of the nervous system, the body in the process of ontogenesis must additionally receive a certain set of genes by horizontal gene transfer. This normally occurs in the perinatal and postnatal periods of the individual development of the body. In order for most of the highly specialized cells in the human body (or other multicellular organism) to begin to fully perform their functions, it's not just "turning on" (expressing) certain groups of genes and "turning off" other groups of genes in the main genome. If everything was so simple, then genetics would have long ago found many genes from the main human genome that are inherent only to us (people) and distinguish us, for example, from monkeys. The fact that a person in terms of his level of development is quite superior to other animal species is usually beyond doubt. And these differences are due precisely to the receipt of additional genes already in the process of human ontogenesis. The main human genome only creates the prerequisites, favorable conditions for the implementation of this most important process, and for this only a small number of genes are necessary. By the way, according to modern genetic research, this is what distinguishes us, for example, from chimpanzees in the main genome.

Conclusion

Thus, after we find out the true place and role of viruses (bio communicators) in nature, we learn about the new classification of the genome (main and acquired) and the nano-model theory of the functioning of the genome, it becomes obvious that the kiss is very important for the exchange of genetic information between partners. In fact, viruses (bio communicators) are migratory organelles of eukaryotic cells, and they perform many vital functions. Bio communicators are essentially the basis of life, thanks to them there is a "revival" of biological systems (cells, multicellular organisms). Thanks to the correct understanding of the new classification of the genome (basic and acquired) and the nano-model theory of the functioning of the genome, the mechanisms of the formation of higher human nervous activity have become clear. Now it's clear how the "inner world" of man is formed.

A kiss can also be used as one of the natural methods of gene therapy [10,11,14], which can be used to treat [12,15] and prevent many diseases. However, it is necessary to know and remember that only a kiss between loving and respecting each other people will be useful and effective for the healing of any person and humanity as a whole.

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