

Fitoviruses—predators of vitamins of plant origin

Abstract

The scientific article presents a new revolutionary approach in interpreting the action of biological active substances (vitamins) on various organisms (ecosystems). New biological theories are presented - 14 viral theories and a genetic theory (nano-model theory of genome functioning). More details are given - the viral theory of electro-magnetoreception, the viral theory of the functioning of the cell's energy system and the viral theory of aging. The latter theory was first presented in this scientific work.

Keywords: phytoviruses, vitamins, aging, antioxidants, electro-magnetoreception

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Introduction

Vitamins are essential micronutrients. They do not give energy, but are vital for the normal functioning of the body and maintaining health. In order to get various vitamins, you should eat foods from all food groups. These are whole grain products, fruits and vegetables, dairy products, fish-egg-poultry-meat products, and added edible fats (for example, nuts, seeds, almonds). If you eat very fatty and sweet foods, of course, you can get a lot of energy, but often such foods are poor sources of vitamins. Vitamins are involved in metabolic processes, regulate the functioning of nerves, and play a role in the formation of bone and muscle tissue. Necessary to protect against infectious diseases. Vitamins protect the body from the harmful effects of free radicals, and therefore many vitamins are called antioxidants. Vitamins are needed in very small quantities, from micrograms to milligrams, but they need to be consumed constantly, because the body does not form their long-term supply. A person is able to synthesize only single vitamins (B₃, B₅, vitamin K, retinol from β-carotene, also vitamin D under the action of solar radiation), and that is only if the starting compounds and favorable external conditions are present. Most vitamins are found in foods of both plant and animal origin, however, digestible forms of vitamins D and B₁₂ are found only in animal foods. In this paper, we discuss vitamins of plant origin, since their synthesis is associated with phytoviruses and electromagnetoreception. However, all scientific ideas and theories are universal and can also be applied to bacteria, animals (including humans).

Vitaminology is a science at the intersection of biochemistry, food hygiene, pharmacology and some other biomedical sciences, studying the structure and mechanisms of action of vitamins, as well as their use for therapeutic and preventive purposes. Already today, on the basis of new biological theories, one can speak of a revolution in the field of vitaminology. It became known by what mechanisms vitamins are synthesized, who is the precursor for their synthesis, how they act on the body and what is the role of genetic mobile elements in all these processes. A large role was played by the nano-model theory of the functioning of the genome, the viral theory of electro-magnetoreception, the viral theory of the functioning of the cell's energy system and the viral theory of aging. The latter theory was first presented in this scientific work and is important in understanding the mechanisms of oxidative stress of cells and shortening telomeres. Telomere shortening is the main mechanism of

natural aging, and oxidative stress of cells is an additional cause of aging. Modern biology pays great attention to the problem of aging, and every year new facts appear that allow a deeper understanding of the mechanisms of this process. Therefore, in this scientific article, we will first introduce our viral theory of aging. So, we will present our new biological theories and the classification of the genome into the main and acquired.¹⁻⁶

New biological theories

As a result of scientific meta-analysis, the viral theories presented in Table 1 were created.⁷⁻¹² According to generally accepted notions, a virus is a non-cellular infectious agent that can be reproduced only inside living cells (prokaryotic or eukaryotic). For more than 100 years, viruses have been considered one of the greatest mysteries of biology. Viruses infect all types of organisms, from bacteria, plants to animals and humans.^{1,5,6} They are found in almost every ecosystem on Earth and are the most numerous biological form. Many researchers believe that viruses are obligate parasites, because they are not able to multiply outside a living cell.¹³ But given the current level of knowledge in various fields of science, there is a need to revise some fundamental ideas about the true functions of viruses in Nature. Therefore, we performed a meta-analysis of various reliable scientific data, starting mainly from 1892.¹² For the first time, the existence of the virus was proved at the end of the 19th century (1892) by the Russian scientist D. Ivanovsky. After his 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." A few years later, when studying cattle diseases, a similar filtered microorganism was isolated. In 1898, when reproducing Ivanovsky's experiments, the Dutch scientist M. Beyerink called such microorganisms "filtering viruses". It is necessary to understand the true place and functions of viruses in nature, and by their example it will be possible to study the fundamental foundations of life. Thus, we have formulated 14 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 the description of all viral theories, and for a review of them, see our previous publications.^{7,9,12} Particular attention should be paid to the viral theory of the electromagnetic reception, the viral theory of the functioning of the cell's energy system and the viral theory of aging. They are described below.

Table 1 Viral theories of VR Sargsyan

| S no. | The viral theory of the electromagnetic reception |
|-------|---|
| | The Viral Theory of Biocommunication |
| | The Viral Theory of Signal Transduction |
| | The Viral Theory of Functioning of The Energy System of Cell |
| | The Viral Theory of The Functioning of The Immune System |
| | The Viral Theory of Perception of Information |
| | The Viral Theory of Memory Formation |
| | The Viral Theory of The Functioning of The Somatic Nervous System |
| | The Viral Theory of The Functioning of The Autonomic Nervous System |
| | The Viral Theory of The Functioning of The Endocrine System |
| | The Viral Theory of The Functioning of The Cardiovascular System |
| | The Viral Theory of The Functioning of The Reproductive System |
| | The Viral Theory of Evolution of The Organic World and Homo Sapiens |
| | The Viral Theory of Aging |

The viral theory of the electromagnetic reception

Viruses that function in the cells of living things can play the role of electro-magnetoreceptors of electromagnetic radiation (including the ultraviolet spectrum). They are universal and very convenient intermediaries for converting one type of signal into another - the conversion of electromagnetic radiation into a sequence of nucleotides in their DNA or RNA molecules. As a result of influencing viruses by electromagnetic radiation, they can easily transform and, at the same time, can easily integrate into the genome of various cells, subjecting themselves to biochemical processes, and subsequently physiological and behavioral characteristics of the whole organism. As a result of the influence of ultraviolet and other radiation spectra on the DNA and RNA of biocommunicators, they change their primary structure and / or spatial-structural organization (shape), which actually contributes to the processes associated with the plasticity of the genome, and therefore also affect neuroplasticity. For more details, see the nano-mock theory of genome functioning, presented below. Biocommunicators are crucial in the synthesis of various biologically active substances of natural origin (for example, vitamins) in various organisms. After all, it is known that the synthesis of vitamins in plants or during the biosynthesis of vitamin D in human skin is played by the ultraviolet radiation spectrum.

It is known that ultraviolet radiation reaching from the Sun to the biological systems of our planet is relatively safe, and cause only genetic changes in the surface cells or viruses of the body. Further, these viruses (biocommunicators) migrate into the body, for example, into the central nervous system, ultimately causing changes in biochemical and physiological processes. If necessary, the body's immune system can destroy these viruses. This mechanism provides

safe and soft regulation of the behavior of all living systems of the biocenosis from the side of the Sun and Outer Space, thus integrating all the biological systems of planet Earth into the Universe.

The viral theory of functioning of the energy system of cell

According to one theory of the origin of mitochondria and plastids as organelles of cells, they arose from free-living prokaryotic cells. At a certain stage in the evolution of the organic world, mitochondria and plastids entered symbiosis (mutually beneficial cohabitation) with eukaryotic cells, performing the most important functions in them associated with the cell's energy system. Mitochondria carry out ATP synthesis as a result of aerobic decomposition of organic compounds, and plastids (chloroplasts) carry out the photosynthesis process. According to other scientific data, bacterial (prokaryotic) cells often have viruses specific to them - bacteriophages. They regulate the activity of bacteria. Mitochondria and plastids are no exception. Based on the above scientific data, we can formulate another viral theory, which is associated with the functioning of the cell's energy system.

Eukaryotic cells regulate the activity of their organelles (mitochondria and plastids) with the help of their other organelles - biocommunicators (viruses). This is one of the striking examples of the function of signal transduction of viruses. Thus, the energy system of the cell (mitochondria and plastids) is fully integrated into the body. The second most important example of the regulation of energy processes in the cell is the process of photosynthesis in cyanobacteria. As you know, it is thanks to the activity of viruses that an ordinary bacterium becomes a full-fledged cyanobacterium capable of carrying out the process of photosynthesis. Based on the foregoing, it can be concluded that viruses are actively involved in the energy processes of prokaryotic and eukaryotic cells. The viral theory of the functioning of the cell's energy system is really the basis for understanding the mechanisms of the formation of many diseases in humans,⁸ including oncological and neurodegenerative ones.¹⁰

The viral theory of aging

Modern biology pays great attention to the problem of aging, and every year new facts appear that allow a deeper understanding of the mechanisms of this process. Today, based on new knowledge in the field of genetics and cell biology, it is already possible to formulate a new theory of aging.

According to the viral theory of aging, shortening of chromosomes in cell division plays an important role. With each cell division, the chromosomes are slightly shortened. Chromosomes have special end sections - telomeres, which after each doubling of the chromosomes become a little shorter, and at some point are shortened so much that the cell can no longer divide. Then it gradually loses its viability - this is what, according to the telomeric theory, is the aging of cells. However, the viral theory differs from the telomeric theory in that it is based on the cause of telomere shortening. It is known that many viruses (biocommunicators) are localized in telomeres, and if their number does not increase, then with each cell division already in daughter cells their number will decrease, since they are distributed among daughter cells during division of the original cell. Thus, aging is the result of a decrease in the number and functional activity of viruses (biocommunicators), resulting in a shortening of chromosomes and apoptosis (cell death). In addition, according to the viral theory of the functioning of the cell's energy system, viruses are actively

involved in the energy processes of prokaryotic and eukaryotic cells. Viruses (phytoviruses) control the activities of plastids (chloroplasts) and mitochondria. As a result of a decrease in their activity, oxidative stress of the cell occurs. It also makes a huge contribution to the formation of many diseases and the aging of the body as a whole.

It is known that normal physical activity, cognitive activity and the intake of natural vitamins inhibit the aging process. These facts confirm the correctness of our viral theory of aging. Since physical and cognitive activity leads to an increase in the number and activity of viruses (biocommunicators) and thus resist the shortening of chromosomes during cell division. The intake of vitamins of natural origin increases the number of phytoviruses (biocommunicators) in the mitochondria of animal and human cells, since they are the precursors of the synthesis of vitamins in plants. When taking vitamins of natural origin (with food), a person absorbs a huge amount of useful phytoviruses. This normalizes the energy processes of the cell and reduces the likelihood of oxidative stress, one of the causes of aging. In previous published works^{7,9} we concluded that viruses are migratory organelles of eukaryotic cells. They are part of us - cellular life forms and perform numerous functions. Viruses are not independent life forms and this is evidenced by the general biological cellular theory. In 1898, the Dutch botanist M. Beyerink actually coined the term “virus”, as he called such microorganisms “filtering viruses”. After 120 years (in 2018),¹² based on the foregoing, we proposed replacing the term “virus” with the term biocommunicator, which certainly corresponds more to their functions in Nature. Below we present our classification of the genome and genetic theory.

The main genome and acquired genome

The genome is hereditary material contained in the cell of the body. The genome contains biological information necessary for building and maintaining the body. Most genomes, including the human genome, are built from DNA and RNA. 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.^{3,14} The main genome is the totality of all genes received by the body from the egg and sperm as a result of fertilization and this is the vertical transfer of genes.¹¹ The acquired genome is the totality of all genes received by the body during the embryonic and postembryonic periods from migrating cell organelles in the form of DNA and RNA molecules. It is important to note that the acquired gene can also be formed on the basis of existing biocommunicator genes under the influence, for example, of electrical processes that occur in the nervous system of the body (see the viral theories of information perception, memory formation and functioning of the nervous system for more details)¹² 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 of natural and artificial origin. It turns out that all changes occurring in the external and internal environment of the body 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 already horizontal gene transfer.¹² The acquired gene is individual for each somatic cell. If the process takes place in gametes, endovirus genes can form, which is already inherited. The role of biocommunicators in unicellular prokaryotic organisms, for example, plasmids play in bacteria. However, they are not able to perform all the functions inherent in biocommunicators. Plasmids carry out active horizontal gene transfer in prokaryotes, viruses are analogues of plasmids for eukaryotes. Bacteriophages (bacterial viruses) are

not biocommunicators (migratory organelles) of bacterial cells and this is indicated by the fact that they forcibly introduce their genetic material into the bacterium. Therefore, we believe that bacteriophages are biocommunicators of various eukaryotic cells, which provide for the regulation of various biochemical processes in bacterial cells, as well as control their numbers.

According to the information on the acquired and main genome, 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 of the genotype. However, combinatorial and mutational variability contribute. The body throughout life - from the moment of fertilization of the egg to death, has the ability to change (enrich or destroy) its genotype due to an increase / decrease in the proportion of the acquired genome. This is accomplished by horizontal gene transfer. Information obtained by the body’s sensory systems about the external and internal environment actively influences the enrichment or depletion of the acquired genome. As a result, the phenotype of the body changes. However, these changes affect only the genes of certain cells of the body. For example, cells of the central nervous system of humans or animals, the immune system or cells of the stomach change. If the changes affect the germ cells, then new signs and properties will begin to be transmitted from generation to generation. So, using the new classification of the genome into the main and acquired, it is possible to achieve a complete understanding of various biological processes that occur at the genetic, cellular and organismic levels of organization, under normal conditions and with various pathologies.¹¹

New genetic theory

According to the 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 However, RNA molecules and, to some extent, protein molecules^{7,9} can also perform a similar function in nature. DNA contains information about the structure of various types of RNA and proteins,² but this does not mean that the DNA molecule does not have the ability to independently carry out numerous biological functions that ensure the life of biological systems. Almost all genes of a living system function on the principle of nano-layouts. 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 science. The protein has a bulk structure due to its II, III, and sometimes IV structure. It is known, for example, that a protein-enzyme has an active center, functioning on the principle of “key to the lock.” Depending on its form, it will have a certain functional activity. A DNA molecule also has a II, and III structure, that is, it is not just a linear molecule consisting of deoxyribo nucleotides.^{2,4}

The whole point of transcription and translation processes is to create a copy of the nano-layout in the form of ribosomal RNA, transport RNA, or messenger RNA. In the case of m-RNA, the biosynthesis of the polypeptide chain follows - translation on polyribosomes in the cytoplasm of the cell. In fact, ready-made copies of nano-DNA models capable of functioning outside the cell nucleus 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 protein biosynthesis, and t-RNAs are 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 polypeptide chain of the protein will acquire a spatial-structural organization and become a functional protein in a functional sense. Thus, the process of generating copies of nano-models based on biological information embedded in DNA is briefly presented here. The nano-model theory of the functioning of the genome fully reflects the numerous processes taking place both at the cellular and organismic levels. It is important to know that genes that function on the principle of nano-layouts are a kind of copy of the macrocosm. Depending on the degree of reflection of the macrocosm at the cellular level, one can judge the level of quality of perception of information from the biological system (for example, humans).

Conclusion

Thus, it became known by what mechanisms vitamins are synthesized, who is the precursor for their synthesis, how they act on the human body (ecosystem) and what is the role of genetic mobile elements in all these processes. We remind you that according to recent studies, a person is not an organism, but an ecosystem populated by microorganisms and viruses. New knowledge is based on an understanding of the correct role and functions of viruses in nature, as well as a new classification of the genome and a nano-mock genetic theory of the functioning of the genome. In fact, viruses (biocommunicators) are migratory organelles of eukaryotic cells, and they perform many vital functions. Biocommunicators are essentially the basis of life. The synthesis of vitamins is carried out under the control of viruses (biocommunicators). In plants, these are phytoviruses. The benefits of natural vitamins that enter the human body through food are also due to eating a large number of bio-communicators (genetic mobile elements). Therefore, raw food (for example, fruits and vegetables) is so useful and necessary for human health. Here, on the basis of the viral theory of electromagnetic reception, the viral theory of the functioning of the energy system of the cell and the viral theory of aging, it became clear the huge role of phytoviruses in the synthesis of vitamins in plants and their useful role in eating food from an animal or human. The viral theory of aging sheds light on the cause of aging and explains the reason why plants and animals (humans) age differently. This is indeed a very important scientific discovery. It also became clear why oncological diseases are formed in humans and some other animals, but plants do not get cancer. And finally, it became clear that in all life processes the role of mobile genetic elements, horizontal gene transfer (formation of the acquired genome) and their functioning according to the principle of biological nano-models are very important.

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Conflicts of interest

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