

Negative Electrization of Air as a Means of Counteracting Airborne Viral Infections

Yuri Pivovarenko

Research and Training Centre 'Physical and Chemical Materials Science', Kyiv Taras Shevchenko University, National Academy of Sciences of Ukraine, Kiev, Ukraine

Email address:

y.pivovarenko@gmail.com

To cite this article:

Yuri Pivovarenko. Negative Electrization of Air as a Means of Counteracting Airborne Viral Infections. *European Journal of Preventive Medicine*. Vol. 10, No. 1, 2022, pp. 34-39. doi: 10.11648/j.ejpm.20221001.17

Received: January 28, 2022; **Accepted:** February 14, 2022; **Published:** February 25, 2022

Abstract: Geneticists and genetic engineers, who constantly introduce nucleic acids into target cells, have experimentally proven that positive electrization of the external environment of cells increases the permeability of cell membranes to nucleic acids. Moreover, they experimentally found that those nucleic acids that are part of positively charged complexes, most quickly penetrate into cells. Thus, the practical experience of geneticists and genetic engineers convincingly proves that the positive electrization of both the cellular environment and the objects present in it, increases the permeability of cytoplasmic membranes for the latter. Accordingly, all this suggests that the positive electrization of the internal environment of the human body promotes the penetration of foreign nucleic acids, especially viral, into its cells. Moreover, given the function of extracellular protons in creating a proton motive force that directs glucose into cells, it can be argued that the positive electrization of the external environment of human cells contributes to the reproduction of viruses in them. Accordingly, it can be expected that the negative electrization of the human internal environment should prevent both the penetration of viral nucleic acids into cells, and the reproduction of viruses there. Naturally, all this allows us to offer negative electrization of the air as the most affordable means to combat airborne viral infections. Offering such a means, we expect that the negative electrization of the air that a person inhales will lead to the same electrization of his internal environment, first of all – his respiratory tracts, which are the first to come into contact with viruses contained in the air. The validity of this offer is discussed here.

Keywords: Virus, Viral, Invasion, Attachment, Adhesion, Obesity

1. Introduction

Both geneticists and genetic engineers, who genetically modify cells through the introduction of nucleic acids, drew attention to the importance of positive electrization of the environment of both target cells and nucleic acids used for the successful penetration of the latter into these target cells [1, 2]. So, such methods of genetic modification of cells as DEAE-dextrin method and lipofection method certainly prove the need for such electrization. In addition, the effective use of cationic (exclusively!) polymers to facilitate the introduction of nucleic acids into target cells also proves this need [2].

Analyzing the nature of phenomena that determine the need for the discussed positive electrization, it is appropriate to recall how the electrization of water affects those of its properties that are interesting in terms of the topic under

discussion. Thus, it was established that positively charged water has an extraordinary penetrating ability, which allows it to evaporate even from closed plastic bottles (Figure 1, right) [3, 4]. (At the same time, this shows that positively electrized water increases the permeability of plastic in contact with it, as well as water irradiated with ionizing radiation [6]). Agree, all this correlates well with the fact that positively charged water is able to hydrate starch, even at room temperature, and give it adhesive properties (Figure 1, right).

Accordingly, the fact that negatively charged water is devoid of the properties inherent in positively charged water (Figure 1, left) [3, 4], which is equally important in terms of the topic discussed here, should also be acceptable.

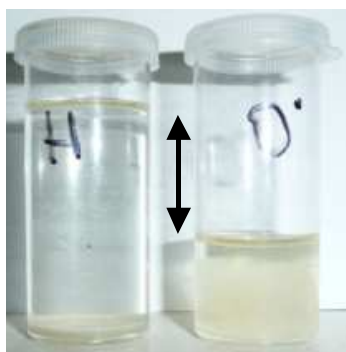


Figure 1. This is the swelling of starch in oppositely electrized waters. At room temperature, the starch does not swell in negatively charged water for at least two months (left); in this case, such water was obtained by bubbling with hydrogen gas, in accordance with [4, 5]. At room temperature, the starch swells in positively charged water for 20 – 39 minutes (right); in this case, such water was obtained by bubbling with oxygen gas, in accordance with [4, 5]. Positively charged water evaporates even from corked plastic bottle: the arrow shows how much the level of such water has decreased during the day [3, 4]; water gets the same permeability under the influence of ionizing radiation [6].

Nevertheless, all this suggests that these unique properties of positively charged water are really used by specialists who use all the above-mentioned methods of genetic modification of cells. To finally make sure that such a suggestion is not far from reality, it is useful to analyze in detail the electrical phenomena that occur during the application of cryogenic method of genetic modification of cells, which consists in deep pre-cooling of an aqueous mixture of target cells and DNA to be injected to them and subsequent heating of such a mixture to 37–42°C [1].

Since this is necessary for such an analysis, let us first recall the Kyon's rule: when two phases are in contact, the phase with a higher dielectric permittivity receives a positive charge and the phase with a lower – negative [5]. Since the dielectric constant of water is ~ 73.1 at 40°C and 88.3 at 0°C [5], this rule allows us to conclude that colder water get a positive charge on contact with warmer water. Accordingly, it can be concluded that the cryogenic method of genetic modification of cells is also actually based on the positive electrization of the aqueous medium, which contains both target cells and the DNA introduced into them.

Consequently, it can be concluded that those specialists who use all the above methods of genetic modification of cells, consciously or unconsciously use the positive electrization discussed here, but achieve it in different ways.

Taken all this into account, let us make sure that these effects of positive electrization are manifested not only in the laboratories of geneticists and genetic engineers. In particular, let us see the leading role of positive air electrization in the spread of airborne viral infections among people. Accordingly, let us see the ability of negative air electrization to prevent the spread of such infections.

2. Materials and Methods

It is known that collagen is the main structural protein of the extracellular matrix, which in particular determines the

effectiveness of intracellular contacts and extracellular interactions [7-9]. In view of this, it was decided to both determine and demonstrate the effect of oppositely charged waters on the adhesive properties of collagen. In fact, it was decided to compare and, if possible, visualize the ability of oppositely charged waters to convert collagen into glue. In this way, as expected, it is possible to understand how different electrization of the external environment of human cells affects its adhesive properties, in particular – in relation of viruses.

For this purpose, a glass Petri dish, the bottom of which contains areas that attach positively and negatively charged water ions, was used. In fact, a Petri dish, the bottom of which combines the properties of positively and negatively charged electrets, was used. The properties of the electrets were given to the bottom of the Petri dish according to the described methods [10].

Collagen was purchased from Ukrreachim (Ukraine).

3. Results

Thus, collagen has been shown to swell in positively charged water enriched in uncompensated protons (Figure 2, right) and not swells in negatively charged water enriched in uncompensated hydroxyl-ions (Figure 2, left), especially at room temperature.

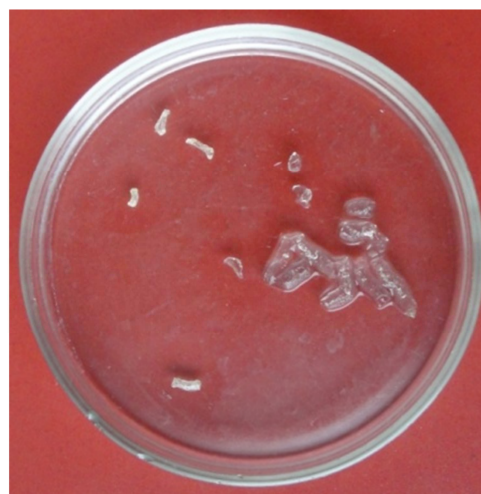


Figure 2. These are weaker (left) and more (right) swollen collagen aggregates left at the bottom of the Petri dish after evaporation of the added water; on the left is the part of the bottom surface of the Petri dish that attracts negative water charges, and on the right is its part that attracts positive water charges.

I hope that this result (Figure 2) clearly demonstrates that positive electrization of the extracellular matrix strengthens its adhesive properties, and negative – weakens.

4. Discussion

Initially, let us realize that the drops that fly out of the mouth of a person who coughs or sneezes, acquire a positive charge due to their friction with the air, in fact – just like raindrops [5].

Let us also realize that the positive electrization of any object, including water, increases its ability to stay in the air, while negative electrization – reduces [11]. The polarization of the clouds (Figure 3) [11, 12] proves the correctness of this statement, at least in relation to small water particles, which is most important in terms of the topic discussed here.

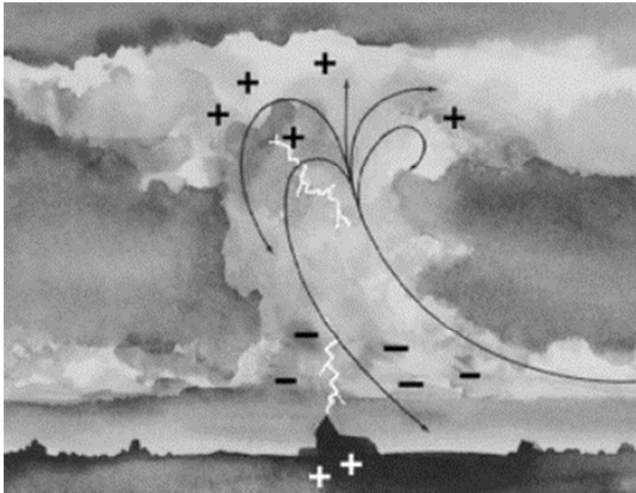


Figure 3. Polarization of clouds: the lower part of a typical cloud has a negative charge and the upper part has a positive charge [11, 12]. Terrestrial positive charges are concentrated under cloud due to the electrostatic induction [13], as shown here by white crosses.

Finally, let us take into account the fact that it is the positive electrization of wet biopolymers that gives them adhesive properties (Figures 1, 2). Agree now that it is the positive electrization of droplets that fly out of the mouth of a sick person that is factor that spreads all airborne infections, including viral. Consequently, the fact that the effective penetration of foreign nucleic acids into target cells occurs precisely with the positive electrization of their environment [1, 2], now seems quite logical. Moreover, such an all-encompassing value of positive electrization suggests that it is the chain that unites all stages of the process of infection of cells with foreign nucleic acids, especially viral.

Let us test right now the performance of all the above considerations, and hence their correctness. Agree that for this purpose it would be logical to make sure that all they are useful in explaining the peculiarities of the spread of airborne viral infections. Since this is relevant, I propose to make sure that these considerations explain the reasons for the uneven spread of coronavirus infections on the planet. So, the rapid spread of these infections among the population of a number European countries, in particular – the United Kingdom, Belgium, Netherlands and northern Italy, especially in those seasons when cloudy weather prevails in these countries, becomes quite understandable given the positive electrization of those earth's surfaces under the clouds (Figure 3) [12], naturally – together with the air in contact with these surfaces. Of course, the high population density in these countries is also important for the spread of coronaviruses among their inhabitants.

(Since cloudy weather is often accompanied by cooling, it is useful to analyze separately in which cases the latter contributes to the spread of viral infections, taking into account the above analyzed phenomena that occur using the cryogenic method of genetic transformation of cells [1]. So, if you extrapolate the temperature regime at which this method is implemented, to humans, it becomes quite obvious that a person, who gets from a cold environment to a warm, creates favorable conditions for the penetration of viral nucleic acids into his own cells. I hope it is quite obvious that the same extrapolation leads to the conclusion that cooling the human body, for example – cold water will prevent such penetration.)

As well, there are other regions of the planet where the rapid spread of coronaviruses among humans may also be due to their positive electrization. Thus, it has previously been shown how both the Gulf Stream and the California Current cause constant positive electrization of the Atlantic and Pacific coasts of the United States and, accordingly, the high susceptibility of their inhabitants to viral infections. It was also shown that in the same way other sea currents cause positive electrization of the east coasts of Japan and Australia and, consequently, to promote the spread of viral infections among Japanese and Australians [14]. It can be added here that the Brazilian current, which exists of the east coast of South America, also causes both positive electrization of the Atlantic coasts of Brazil and Argentina, and, therefore, the high susceptibility of the inhabitants of these countries to coronaviruses. Of course, the high population density in such regions is also important for the spread of coronaviruses among humans. Although the latter statement seems obvious, it needs to be discussed separately.

First of all, the fact that everyone is a source of positively charged vapors, which are released during sweating and respiration, must be realized. This, in turn, means that everyone creates conditions in the immediate air that, as shown above, contribute to the spread of viruses through the air. It is clear that crowds create such condition more effectively than an individual. Thus, the advice to avoid crowds is based on purely physical and physiological grounds.

Consequently, the proposal to prevent the spread of airborne viral infections through negative electrization of the air, which is announced in the title of this article, seems both reasonable and expected. Moreover, it can be also expected that such negative electrization can significantly slow down the synthesis of viral nucleic acids in the cells to which they have already penetrated. Such expectation is based on the fact that the concentration of extracellular protons determines the power of the proton motive force, under the action of which glucose enters the cells (Figure 4A) [15–17]. This function of the proton motive force suggests that the supply of glucose to the affected cells will slow down by reducing the extracellular concentration of protons, which will inevitably occur with negative electrization of the extracellular environment.

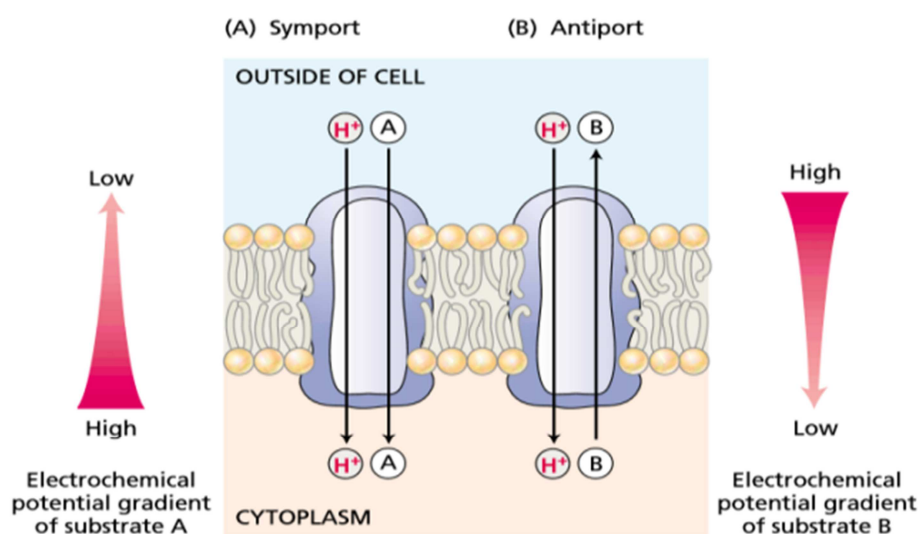


Figure 4. The energy of proton gradients on cytoplasmic membranes allows cells to realize two types of secondary active transport: symport and antiport. At the symport (A), a proton, penetrating into a cell from the outside, captures one glucose molecule. With antiport (B), the energy scattered by a proton entering the cell from the outside can be used to remove cations (for example, sodium ions) from the cell [17].

So, given the critical energy value of glucose for cells [18–20], we can accordingly expect a slowdown in the metabolism of cells that are in an environment that is poor in protons, first of all – uncompensated. In view of this, the expectation of slowing down the very energy-intensive synthesis of nucleic acids [19, 21], including viral ones, in such cells does not seem unreasonable. So, in the end, there may be a slowdown in the spread of viral nucleic acids in the human body, as well as suppression of the inflammatory process in it.

Given this very function of proton motive force (Figure 4A), it is also possible to explain the acceleration of metabolism in cells whose environment is positively charged and therefore enriched with protons. Consequently, the fact that the power of this force is directly determined by the concentration of extracellular protons allows explaining the fast spread of coronaviruses among the inhabitants of those countries whose positive electrization of air is due to climatic and geophysical reasons [14]. Moreover, this very determination allows also explaining both the large number of overweight people in these countries and their hypersensitivity to coronavirus [22].

To facilitate such an explanation, it is necessary, first of all, to realize that the weight of water, which is the basic substance of the human body [23], mainly determines a person's weight. For this very purpose, it is also necessary to accept the fact that only positively charged water is able to hydrate biopolymers, and, therefore, bind to them (right parts in Figures 1 and 2). Thus, the combination of only these two facts allows us to conclude about the positive electrization of the water in the bodies of overweight people. (Actually, human obesity can be seen as a sign of predominantly positive electrization of his internal environment.) Accordingly, it can be concluded that the internal environment of such people is the most favorable both for

penetration of viruses into human cells, and for their reproduction there. (Whatever it was, but the proposed ideas allow you to answer even the question recently asked by Meredith Wadman (“Why COVID-19 is more deadly in people with obesity?” [22]), which still remains unanswered.) Given all this, it can be expected that human inhalation of negatively charged air will inevitably be accompanied by negative electrization of his internal environment, which will reduce both a person's sensitivity to any virus and his weight.

If you have a positive attitude to all of the above, you probably will not be superfluous to learn about the ways of negative air electrization. To understand the phenomena on which the simplest method of negative electrization of air is based, it is necessary to mention its negative electrization by raindrops, which occurs in accordance with the above-mentioned Kyon's rule [5]. Therefore, a fountain or other dropping water source can be expected to be completely effective source of negative air ions.

As well, thermo-electron emission [24], the household source of which is any heated fan, can also be used.

After all, an usual fan located under the ceiling, which directs the room air clockwise, can be used to enrich such an air with negative air ions, at least in the northern hemisphere. Although this kind of fan use seems unusual, it is based on well-known physical phenomena [12, 14, 25]. (Of course, this is exactly what the fan should rotate the air counterclockwise in the room, which is located in the southern hemisphere.)

Naturally, those traditional medicines, the therapeutic effect of which is due to their ability to negatively electrize the human internal environment, it is also advisable to use to prevent viral infections. Given that aquatic environment acquires a negative charge precisely from contact with hydrogen gas (Figure 5) [4, 5], its inhalation looks enough promising to combat all viral diseases.

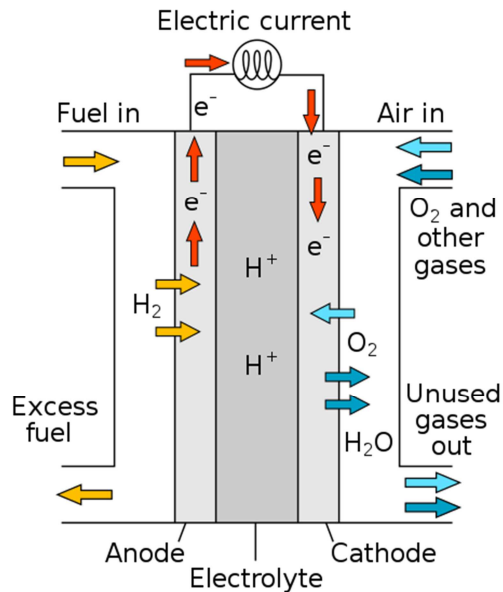


Figure 5. This is the scheme of an air-hydrogen electrochemical cell [4, 5]. Red arrows indicate the movement of electrons from the compartment with an aqueous solution saturated with hydrogen gas, into the compartment with an aqueous solution saturated with air, the oxygen of which sorbs electrons [4].

Thus, the assumption that inhaling hydrogen gas at the very least will prevent coronavirus disease [26] seems plausible. (In this regard, freely available household hydrogen may still be useful).

Besides, it should be noted that the contact of the aquatic environment with oxygen causes positive electrization of the latter (Figure 5) [5]. In view all the above, it can be argued that inhalation of oxygen-enriched gas mixtures will contribute to the spread of viruses in the human body. Moreover, the results presented here (right parts in Figures 1 and 2) give grounds to claim that inhalation of such mixtures by the patient contributes to thrombosis of her blood vessels. Unsuccessful attempts to counteract the coronavirus with oxygen masks confirm both of these statements.

Probably, low-frequency pulsating electromagnetic fields can also be used for negative electrization of the human internal environment [27]. Since the household medical sources of these fields are freely available, such an offer seems quite appropriate.

Unfortunately, the views of virologists and molecular biologists on the ways in which foreign nucleic acids, including viral ones, enter cells do not allow them to constructively accept all these ideas, as well as practical experience of geneticists and genetic engineers. So, they still believe that viral nucleic acids are able to cross the outer cell membranes only through the gates formed by the corresponding receptors of viruses. Moreover, they have a common view that viruses interact with their receptors like a “key” to a “lock”, therefore – purely mechanistic [28–32]. Thus, such mechanistic beliefs leave no room for electrical phenomena and interactions that cause or accompany the penetration of viral nucleic acids into cells. Moreover, images commonly used by molecular biologists to illustrate the interactions of viruses and cells give the impression that

such interactions occur in a vacuum rather than in an aqueous medium [28–32]. Thus, such images encourage us to ignore both the aquatic environment, in which these interactions occur, and those of its properties that depend on its electrization. It is obvious that one of the consequences of the spread of such views and images is that they mask the predominantly electric nature of interactions under discussion.

5. Conclusion

The practical experience of geneticists and genetic engineers proves that the positive electrization of the environment both target cells and foreign nucleic acids promote the penetration of the latter into such cells. Since viral nucleic acids are definitely foreign to the cells of the human body, this experience allows expecting that the negative electrization of the internal human environment can prevent the penetration of viral nucleic acids into the cells of the human body.

However, the experience of bioenergetics proves that the proton motive force by which glucose enters the cells requires the presence of uncompensated protons in the extracellular environment. This, in turn, allows expecting that negative electrization of such an environment will prevent the reproduction of viruses in cells to which viral nucleic acids have already penetrated. This expectation is based on the fact that glucose is the main carrier of chemical energy for the cells.

Since both of these expectations undoubtedly have an experimental basis, they allow us to responsibly offer a negative electrization of the human internal environment as a universal means of counteracting viral infections.

As well, given that the positive electrization of droplets that fly out of the human mouth causes their flying and adhesive properties, negative electrization of air can be considered as a universal means that at least complicates the spread of airborne infection, including viral, among humans. Moreover, taking into account all the above, we can expect that breathing negatively charged air will prevent the spread, at least rapidly, of viruses in the human body that is already infected with them.

At the very end, I would like to inform you that none of the volunteers who followed the above advice have been infected with influenza and coronavirus.

References

- [1] V. V. Lysak (2005) Microbiology. Minsk: Edition of Belarus State University, 261. In Russian.
- [2] O. M. Shirokova and M. V. Vedunova (2013) Methods of Genetic Transformation. Nizhny Novgorod: Nizhny Novgorod University Publishing House, 30. In Russian.
- [3] Y. Pivovarenko (2018) ± Water: Demonstration of water properties, depending on its electrical potential. World Journal of Applied Physics, 3 (1), 13–18.

- [4] Y. Pivovarenko (2019) Biochemical and Physiological Basis for Treating Hydrogen Gas as a Medicine. *European Journal of Preventive Medicine*, 7 (6), 100–107.
- [5] B. V. Nekrasov (1974) Basics of General Chemistry, 1. Moscow: Chemistry, 656. In Russian.
- [6] J. E. Spangenberg and T. W. Vennemann (2008) The stable hydrogen and oxygen isotope variation of water stored in polyethylene terephthalate (PET) bottles. *Rapid Commun. Mass Spectrom*, 22, 672–676.
- [7] M. L. Tanzer (2006) Current concepts of extracellular matrix. *Journal of Orthopedic Sciences*, 11, 326–331.
- [8] S. H. Kim, J. Turnbull and S. Guimond (2011) Extracellular matrix and cell signaling: the dynamic cooperation of integrin, proteoglycan and growth factor receptor. *Journal of endocrinology*, 209, 139–151.
- [9] A. D. Theocharis, S. S. Skandalis, C. Gialeli and N. K. Karamanos (2016) Extracellular matrix structure. *Advanced Drug Delivery Reviews*, 97, 4–27.
- [10] R. Singh (2015) A Review of Applications of Polymer Electrets. *Advance Physics Letter*, 2 (3), 16–20.
- [11] Y. Pivovarenko. (2017) The Significance of Positive Electrization on Lifting Force. *American Journal of Aerospace Engineering*, 4 (6), 59–62.
- [12] Y. Pivovarenko (2018) The Nature of the Celestial Elves, Sprites and Jets. *Discovery Nature*, 12, 1–4.
- [13] E. M. Purcell and D. J. Morin (2013) Electricity and Magnetism in BPC, 3rd Edition. Cambridge: Cambridge University Press. 853.
- [14] Y. Pivovarenko (2021) The Gulf Stream and the Californian Current as factors affecting the behavior and health of Americans. *Journal of Human Physiology*, 3 (2), 51–56.
- [15] N. Lane (2010) Why Are Cells Powered by Proton Gradients? *Nature Education*, 3 (9), 18.
- [16] N. Lane, J. F. Allen and W. Martin (2010) How did LUCA make a living? Chemiosmosis in the origin of life. *Bioassays*, 32, 271–280.
- [17] L. Taiz and E. Zeiger (2002) *Plant Physiology*, 3rd ed. Sunderland (UK): Sinauer Associates, Inc., 690.
- [18] T. El Bacha, M. R. P. Luiz and A. T. Da Poian (2010) Dynamic Adaptation of Nutrient Utilization in Humans. *Cell Origins and Metabolism*, *Nature Education*, 3 (9), 8.
- [19] S. Cosnier and M. Holzinger (2014) Towards glucose biofuel cells implanted in human body for powering artificial organs. *Electrochemistry Communications*, 38, 19–23.
- [20] S. Devahastin (2018) Food Microstructure and Its Relationship with Quality and Stability. Wood head Publishing Series in Food Sciences, Technology and Nutrition, 193–216.
- [21] Z. A. Shabarova and A. A. Bogdanov (1978) Chemistry of Nucleic Acids and their Components, Moscow: Chemistry, 584. In Russian.
- [22] M. Wadman (2020) Why COVID-19 is more deadly in people with obesity – even if they’re young. *Science*, publication date: September 09 2020. doi: 10.1126/science.abe7010.
- [23] Y. Pivovarenko (2021) Electrified Water as a Regulator of Cell Proliferation. *Journal of Oncology Research*, 3 (1), 1–10.
- [24] D. G. Fink and H. W. Beaty (2000) Standard Handbook for Electrical Engineers (14th ed.). NY: McGraw-Hill Companies, Inc.
- [25] Y. Pivovarenko (2019) Earth's Electromagnetic Forces and Their Participation in the Creation of Tornadoes. *American Journal of Electromagnetics and Applications*, 7 (1), 8–12.
- [26] F. Yang, L. Y. Ruiming, L. Xiaoxiu, L. Rongan and H. Xiaobo (2020) Hydrogen A Potential New Adjuvant Therapy for COVID-19 Patients. *Frontiers in Pharmacology*, 11 (543718), 1–5.
- [27] Y. Pivovarenko (2019) Arborization of Aqueous Chlorides in Pulsed Electromagnetic Fields as a Justification of Their Ability to Initiate the Formation of New Neuronal Dendrites. *International Journal of Neurologic Physical Therapy*, 5 (1), 21–24.
- [28] M. Marsh and A. Helenius (2006) Virus entry: open sesame. *Cell*, 124, 720–740.
- [29] K. M. Guglielmi, E. M. Johnson, T. Stehle and T. S. Dermody (2006) Attachment and cell entry of mammalian orthoreovirus. *Current Topics in Microbiology and Immunology*, 309, 1–38.
- [30] J. Grove and M. Marsh (2011) The cell biology of receptor-mediated virus entry. *Journal of Cell Biology*, 195, 1071–1082.
- [31] J. Fantini and N. Yahi (2015) Brain Lipids in Synaptic Function and Neurological Disease, Chapter 12. Amsterdam: Elsevier Inc.
- [32] M. S. Maginnis (2018) Virus-Receptor Interactions: The Key to Cellular Invasion. *Journal of Molecular Biology*, 430 (17), 2590–2611.