



NEW DIRECTIONS IN INCREASING BIOLOGICAL ADAPTATION AND HUMAN HEALTH: SPECTRAL-DYNAMIC IMPACTS

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1. Fundamentals of human homeostasis.

Evolutionary improvement of organisms is largely due to the increase in their level of independence from the environment. This is possible only on the basis of the constancy (homeostasis) of the internal environments of the organism. At the same time, a complex system of regulation has been created at the molecular, cellular, tissue, organ, and organism levels.

The basic processes, such as synthesis and breakdown, are balanced and fixed in the form of hereditary traits. Violations of this balance can manifest as syndromes or diseases. In this case, the organism turns on mechanisms, an outlet to restore homeostasis.

In the process of self-regulation, feedback plays a role. There are positive and negative feedbacks. In this case, the positive feedback increases the effect of the input factor-signal, and the negative decreases.

All types of self-regulation operate on the same principle: any deviation from the basic level of regulation serves as a stimulus for turning on mechanisms that correct the violation. Depending on the nature of the violation, a certain algorithm of regulation is triggered.

For higher vertebrates and humans, ultrastability is characteristic. Ultrastability suggests an active search for homeostasis mechanisms and assumes multi-contouring. In this case, the

same controlled process can be controlled by several control systems due to the connections between them and the backup systems. For reliability, regulation can be duplicated.

2. Human fluid systems and their regulation

2.1. Water as a medium for the realization of biochemical processes

It is known that all biochemical processes occur in liquids involving water. Water is not only a medium for the interaction of other molecules, but also a participant or result of biochemical reactions.

In the digestive system, the hydrolysis of proteins involves the attachment of water molecules (formed as a result of protein digestion by enzymes) to the amino acids. During the synthesis of protein from amino acids, water molecules separate from them. Also, water molecules participate in the process of intermittent amino acid metabolism: they are cleaved off during the conversion of phenylalanine to tyrosine, and attached in the process of hydroxylation of proline and lysine.

In the synthesis of fats from glycerol and fatty acids per molecule of fat there are 3 water molecules. In cellular respiration, glucose breakdown occurs with the participation of oxygen. As a result, carbon dioxide, water and energy in the form of ATP are formed.

2.2. Ways of fluid intake into the body and cells

The main way of entering the liquid into the body is the digestive tract. With sufficient humidity, some of the liquid enters through the alveoli from the air. And minimally - through the skin. The permeability of cells for water molecules is considerable. Penetration of water into cells and tissues is carried out: by osmotic gradient due to diffusion, due to the difference in hydrostatic pressure (ultrafiltration), and also in the presence of an electric gradient - electroosmosis.

Blood plasma is an important source for the inflow of fluid to cells. The capillary endothelium, separating the blood plasma from surrounding tissues and cells, is almost completely permeable to water and low molecular weight substances. The inflow of water into the bloodstream is facilitated by colloid-osmotic blood pressure. The balancing of the hydrostatic and colloid-osmotic gradient occurs only in the central parts of the capillaries. In the venous parts of the capillaries, water moves from the intercellular fluid to the blood plasma. The fall in the colloid-osmotic pressure of the blood plasma occurs in the condition of acute blood loss, shock, burns, and acute radiation sickness.

2.3. Regulation of the human fluid system

A human being has a multidimensional system of fluid regulation in the body. The main centers of regulation are in the brainstem and hypothalamus. Nutritional sensations and thirst are the result of the joint activity of the hypothalamus and cerebral hemispheres of the brain.

The presence of the receptors in the main vascular reflex zones and osmoreceptors in the hypothalamus allows to carry out a sensory change in the osmotic pressure and triggering a thirst sensation in the case of fluid deficiency. Biologically active substances cholecystokinin and opioid peptides are important, which lead to increased water consumption.

The most important factor in the regulation of the body's fluid system is kidneys. Kidneys, filtering blood plasma hourly, can increase or decrease diuresis. Renin and angiotensinogen can significantly change the rate of filtration, and mineralocorticoids and ADH can change the rate of reabsorption.

If the regulatory factors of blood's plasma and kidneys are well studied, the regulation of the intercellular fluid has not been studied enough. An adult has 15-16 liters of intercellular fluid. It is the main one for cells and tissues and the main reserve of fluid for lymph. Formation of intercellular fluid is connected to the activity of the microcirculatory bed. The specific role of the endothelium of capillaries in the intracellular fluid exchange has not been studied well.

In the assessment of the liquid saturation of the human body, salivation should be taken into account. Saliva gives from 0.5 to 1.5 liters of fluid per day. Stimulation of saliva production is provided by irritation of the receptors of the oral mucosa. Autonomic regulation of salivation is important one. Parasympathetic nerve endings through acetylcholine activate the secretion of saliva. Sympathetic nerve endings can also stimulate salivation.

Regardless of the replenishment of the human's body with water, the human being himself is an aquatic system. The main reservoir of water in humans is its cells.

The basic volume of the cell is occupied by water (74-76%). Water penetrates into the cell through submicroscopic pores and because of dissolution in the surface lipids and cytoplasm. The permeability of liquid substances is related to the electrical properties of molecules.

M. Jacobs isolated electrically symmetric (nonpolar) and asymmetric (polar) molecules. Non-polar compounds are highly soluble in lipids, and polar compounds are highly soluble in water, providing the hydrophilicity of the substrate.

In order for a molecule or ion of a water-soluble substance to penetrate the cell, they must have energy. The less potential barrier, the more particles penetrate into the cell.

3. Biophysics of the cell

Cells have the ability to separate, reproduce their own kind, have excess energy. Undoubtedly, all processes in the cell obey the laws of physics and chemistry.

From the standpoint of cell biophysics, the most studied are such processes as permeability, electrical conductivity and electrokinetic processes, thermodynamics.

Biophysics faces the task to determine the physico-chemical causes of the emergence and development of bioelectric potentials, to open the way for the deep analysis of the physico-chemical state of cells in the norm and pathology. These indicators are important for predicting and assessing the state of the organism, its most important systems, tissues and cells.

Conducted biophysical studies reveal the subtle mechanisms of cell interaction, the basis of their metabolism and energy. An important direction is the disclosure of the mechanisms of interaction of cells with the environment, the permeability of substances in cells, the formation and change of the membrane potential of cells and electrical conductivity.

4. Spectral-dynamic (SD) impacts on humans. Basic provisions

The essence of the spectral-dynamic method is the using and analysis of electrical oscillations of the electric field of the human body in the frequency range from 20 Hz to 11 kilohertz with a current change frequency of 1 millivolt. The basis of the diagnostic scan is the account of the direction of rotation and the rotation speed of the phase planes of the field. Comparison of the obtained results with the norm indicators (left rotation) reveals the direction of the process. Thus, it reveals pathological processes (with the right rotation of the electric field) and the nature of the pathological process. In the acute course of the pathological process, a rapid rotation of the field is detected, while in the chronic process a slow rotation is detected.

Spectral-dynamic methods are able to take consideration of wide spectrum of oscillations: molecules, molecular complexes, membranes with enzymes mounted on them, enzymes themselves, whole cells, cells aggregates and associates.

This allows to use the method not only for diagnostics, but also for correction of disturbed oscillatory processes.

5. Cytological bases of SD action on the human body

The presence of an electric charge on molecules and molecular complexes makes the cell a complex electric microcomplex. Many cell structures are able to respond to external electrical and electromagnetic influences. This ability changes during the life of the cell. Pathological processes can nonspecifically or specifically change the bioelectrical parameters of cells. Possible correction of bioelectric parameters taking into account the arisen violations.

Analysis of violations in the human body successfully solves the spectral-dynamic diagnosis. CJSC «SPA «JCB» successfully developed algorithms for correction of disorders and portable devices for the implementation of therapeutic effects.

The impact of the programmed «Immunity», CJSC «SPA «JCB» has been studied on the 5 patients with bronchopneumonia and 5 patients with malignant tumors.

Blood cells were placed in a chamber for microscopic examination and studied at 600 times magnification using the instrument for signal alternative microelectrophoresis «Cyto-expert» using the method of alternating microelectrophoresis (MEP). In addition to the analysis of the parameters of the MEP, visual cytological studies were carried out using vital stain. Changes in the volume and surface of cells were evaluated. The results of health programs were compared with the control on hematological analysis before and after exposure.

A special place was taken by programs related to the effects on Staphylococcus Aureus, Streptococcus and the «Candidias» program on Candida.

Results

1. The Action of the program «Antibiotic» on the isolated blood of 5 patients with the diagnosis of «Bronchopneumonia».

№	Initial data			The Action of the program «Antibiotic»		
	% of active erythrocytes	Amplitude of erythrocytes	Average amplitude of erythrocytes	% of active erythrocytes	Amplitude of erythrocytes	Average amplitude of erythrocytes
1	67,3±3,4	5,7±1,1	2,1±0,2	86,9±1,7	8,4±1,2	2,8±0,6
2	24,3±2,4	1,2±0,8	0	63,7±1,9	4,2±0,9	2,4±0,7
3	36,7±2,3	2,3±1,2	1,5±0,3	76,4±2,1	8,7±1,4	2,0±0,3
4	64,7±1,8	7,2±1,4	1,2±0,2	84,2±2,3	11,3±1,7	3,4±0,5
5	80,3±2,2	4,3±1,3	1,3±0,5	92,5±1,4	7,2±1,2	2,7±0,2

Thus, the use of this program leads to the activation of the blood elements. This is extremely important for leukocytes.

2. Influence of the «Immunity» program on lifetime reactions of erythrocytes and leukocytes of a practically healthy person (25 years).

Type of isolated cells	Intravital bioelectric parameters			
	Before exposure		After exposure	
	% of activated structures	Amplitude of oscillation	% of activated structures	Amplitude of oscillation
Erythrocytes	74,6±3,2	7,3±1,1	86,5±2,4	9,6±0,9
Leukocytes	3,5±0,7	6,5±1,3	18,8±1,2	8,7±0,8

An important indicator is the level of activation of leukocytes, since they are the main figures of immune responses.

3. Results of the action of the program «Staphylococcus» on the lifetime reactions of *S. aureus*.

After 10 minutes of exposure of the program, a pronounced bactericidal effect was detected.

4. The influence of the program «Candidiasis» on live drusen of fungi of the genus *Candida*.

After 10 minutes of exposure, hyperchromia of protein elements of pathogenic fungi occurs, indicating microcoagulation. In the subsequent there is disaggregation of drusen, decay.

Conclusions.

Studies have shown that the impact of the program is safe for the cells of the body, have an selective bactericidal effect on microbes and harmful effects on the pathogenic *Candida* fungi. An important aspect of the impact of the «Immunity» program is the ability to stimulate lifelong leukocyte reactions.

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