

the public health field financial policy (e.g. I should not want to be agreed with Mr. A. Potapov<sup>1</sup>);

— to return all the state medical and the prophylactic institutions (e.g. the hospitals, the polyclinics, the sanatoria, the rest homes, the boarding houses, the children health – improving institutions) to the people;

— to return all the preschool education institutions to the children (and also to their parents);

— to return the gratuitous sporting schools, and the athletic complexes to the children, and so on, and so forth.

After all, we shall not work the vitally important for us challenge out – the healthy population extended reproduction provision challenge – without the cardinal changing of the financially – organizational system just in the public health field and the medical science, which has been emerged for the last 15–20 years, without the sufficient programs financing of the further population health improvement.

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#### THE LYMPHATIC SYSTEM SEGMENTAL ORGANIZATION

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The lymphatic system is being gathered the «excessive» tissue fluid in the lymph form just from the organs. The lymphatic channel walls structure is being complicated during its length: the lymph capillaries (LC) endothelium, the valves are being appeared in the lymph post – capillaries (LPC), the myocytes – in the lymphatic vessels (LV), and the lymphoid tissue – in the lymph nodes (LN). The lymphangions contractions – e.g. the LV valvate segments are being served the lymph flow main motive power, according to E. Horstmann (1951, 1959) and H. Mislin (1961, 1983). The distal valve and the proximal muscular cuff are being entered in to their structure. The valves cusps are not contained the myocytes, and they are being moved passively, by the lymph flow gradient. But the lymphangions with one valve are not being functioned (Webb R., 1933). And so, I have suggested to consider the lymphangion, as the intervalvular segment with the myocytes just in the walls: the muscular network from the muscular segment cuff is being spread over both its valves, e.g., as the inlet one, well as the outlet one, –

the single structurally – functional system. The intervalvular segment is being appeared to be the lymphatic system universal structure.

The human's and the animals' lymphatic channel whole mounts have been stained by the gaullocyanine by Einarson, the histological sections – by the picrofuchsin, by the orcein, by the azan by Geidengain, by the benzidine on the myoglobinperoxidase; they have been impregnated by the silver nitrate; they have been treated by the reagent with the antibodies to the myocytes  $\alpha$  – actin. The rat's LC, LPC, LV electron microscopy has been conducted.

The LV valves are being contained the smooth myocytes. The valve's muscle is being continued into the cusps just from its basis, by means of the muscular bundles it is being connected with the muscular cuffs of the adjacent lymphangions and with the other valves. Such muscular connections are being permitted the contractions coordination of the lymphangion's various parts and the various lymphangions. The valve's muscle is being served not only its tensor, but it is also able to change its cusps' position, and, thus, to regulate, actively, the lymph flow just between the lymphangions. The valves are being divided the lymphatic channel into the intervalvular segments, which are quite various by their structure. Their variable movements are being defined by the surrounding tissues: 1) the tissue fluid is being filtered into the LC and LPC lumen – the lymphopoiesis, the primary lympho – motive force (e.g. the tissue pump piston); 2) The tissues' mechanical pressure on the LC, LPC and LV walls (e.g. the tissue pump external cuff); 3) the reverse lymph flow, having appeared at the lymphopoiesis energy insufficiency, is being closed the valves; the lymph is being accumulated, and it is being stretched out the walls' intervalvular segment, that it is resulted in the myocytes membranes deformation and the depolarization – so, the LV contractive activity mechanism is being switched on in such a way. The valve is being belonged to the both adjacent lymphangions, it is being united together their walls, but it is being divided their cavities at the closing (e.g. the compartmentalization). The adjacent lymphangions are being contracted, frequently, in a separate way, at the critical lymph portion entering in them, but they are able to be contracted together: the supra-valvular myocytes bundles are being expressed just in the large LV, they, in their turn, directly, are being connected the adjacent lymphangions muscular cliffs, having passed the valves, – this is the short and the direct way of the muscular contraction wave spreading on the LV length. The valvate segment is the semi – open system with the infinitely large capacity, therefore, it is not able, independently, to be contracted and to provide the efficient lymph transport. So, the valvate segment is being stopped the reverse lymph flow, that it is preceded, as the biomicroscopy has been shown, the intervalvular segment contraction launching just in the field of the valvate sinus.

<sup>1</sup> «It is extremely difficult to reform the emerged public health financing system» – Potapov A.E. – «The Russian Federation Public Health». – №5 – 2008, p.3.

The LN ones have the complex (e.g. with the lymphoid tissue in the walls), or the lymphoid lymphangions structure, which, simultaneously, are being regulated the lymph volume and its composition. The LN capsule muscular network (e.g. the nodal lymphangion muscular cuff) is being connected with the LV lymphangions and the border valves with them, by means of the muscular bundles in the continuous lymphatic channel composition. The LPC valves are very thin, and they have a form of the cells' small thickening in the LPC of the first order. The LPC one is being consisted in the intervalvular segments without the myocytes presence just in the walls. The movable interendothelial contacts in the LC walls have been organized, as the intramural mini – valves. They are, constantly, being regulated the tissue fluid filtration just in the LC cavity – e.g. its outflow from the tissue channels into the lymphatic channel. The endothelium intramural valves are being found in the opening of the LC segments, and the LPC real valves – at the outlet just from the LC (network). The surrounding them tissues, including – the muscular ones, are being played the cuff role for the LC and the LPC intervalvular segments.

#### Conclusion

The lymphatic channel intervalvular segments with the different structure are being organized the lymph partial movement just from the organs to the veins, under the lymph flow proper energy deficiency conditions. The lymph flows channels are being taken their place only under the extravasal factors influence in the non – muscular sections (e.g. the tissue fluid flow pressure and the surrounding tissues), the LV and the LN contractive activity mechanism is being switched on, at their energy insufficiency just in the muscular sections.

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#### STRUCTURE OF THE BLOOD-TISSUE METABOLISM

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Substances move from metabolic microvessels to the tissue channels and back, through the endothelium in their areas of microvasculature. I suggest that this microvascular-tissue complex should be called a “domain of hemo-tissue metabolism”. Transport vessels unite the domains into a common system. Domain configuration is determined by the structure of a vascularized area. In the mesentery between two mesothelium layers is a loose connective tissue, veined with a network of different microvessels. A hollow organ can be presented as a sheet rolled in a pipe;

muscular layers divide it into membranes with a multi-layer microvasculature, and microcirculatory channels of external layers overlap the transport vessels, going from the inner layers. Formation of folds, villi, crypts, acinuses and lobules leads to an adequate deformation of the domain. They have a network structure: thin fascicles of connective tissue fibers and capillaries form loops of a microvascular-fiber network. Inside the loops, is a dense network of thinner connective tissue fibers and tissue channels. They unite blood and lymphatic microvessels as “functional anastomoses”: connective tissue fibers and hydrophilic amorphous substance act as an external cuff, restricting the tissue channels from widening and directing the substance current into the microvessels with a different wall permeability.

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#### LYMPHATIC AND LYMPHOID SYSTEMS

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While immunity is in the spotlight, lymphatic vessels are being regarded as appendage of the lymphoid system. In the international anatomic terminology (New-York, 1998), there is no such term as «lymphatic system». Section «Cardio-vascular system» describes lymphatic ducts and trunks, mentions lymph nodes, but their detailed description is given in section «Lymphoid system». In my opinion, lymphoid and lymphatic systems are interconnected in the peripheral parts and are specialized areas of a common cardiovascular system. The core of the lymphatic system are lymphatic vessels that transport the tissue fluid and large-grain particles, which did not get into blood channels. In the lymphoid system, the central position occupy blood vessels that provide lymphocyte circulation. Lymphocytes gather in the area invaded by antigens and along their pathway in the organism. Primary lymphatic tracts, capillaries and postcapillaries are characterized by higher wall permeability. That is why antigens penetrate into their openings, lymphoid nodes and patches form around the source (tissue channels) and roots of the lymphatic channel before and after human's birth, and lymph nodes – around lymphatic vessels with endothelial walls outside the organs, at a 3-5 month fetus.

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