

COMPARATIVE CHARACTERISTICS OF THE REACTION OF THE CELLULAR ELEMENTS OF VENOUS BLOOD IN CONTACT WITH THE CARBON HEMOSORBENT AND FIBER OF CHITOSAN *IN VITRO*

O. P. Kirichuk^{a, b}, E. N. Maevskaia^a, N. V. Burkova^{b, *}, E. N. Dresvyanina^{a, c}, S. I. Kuznezov^b,
I. P. Dobrovol'skaya^{a, d}, and V.E. Yudin^{a, d}

^a*Peter the Great St. Petersburg Polytechnic University, Department of Medical Physics, St. Petersburg, 195251 Russia*

^b*Almazov National Medical Research Centre, St. Petersburg, 194156 Russia*

^c*Saint Petersburg State University of Industrial Technologies and Design, Department of Materials Science and Commodity Expertise, St. Petersburg, 191186 Russia*

^d*Institute of Macromolecular Compounds, St. Petersburg, 199004 Russia*

**e-mail: n.burk@list.ru*

The aim of the work was a comparative characteristic of the reaction of human venous blood cell elements *in vitro* to contact with the carbon sorbent used in the procedure of low-volume hemoperfusion and chitosan fibers. The formation of chitosan fibers was carried out from a 4% solution of chitosan in a 2% solution of acetic acid at the laboratory installation of IVS RAS by coagulation method. During 60 min of the experiment, 26 parameters were recorded on the Sysmex XT 1800i hematological analyzer in blood samples in contact with hemosorbents in the rotational mode. The optical density was recorded on a Unico 280(S) spectrophotometer at wavelengths corresponding to the absorption maxima of the hemoglobin molecule (414 and 540 nm). Analysis of the results showed that chitosan fibers have greater hemocompatibility and the ability to modify the surface of the fibers by selective agents. Based on the data obtained, it can be concluded that chitosan fibers can be used in the procedure of low-volume hemoperfusion both independently and as a neutral matrix for the construction of specific hemoactivators for the practical application of this biopolymer in effective medical treatment regimens.

Keywords: erythrocytes, leukocytes, platelets, carbon hemosorbent, chitosan fibers, hemocompatibility, spectral characteristics of blood plasma