Conclusion. The obtained results allowed us to determine the optimal method of the separation of rodent nervous tissue-derived cell culture, which can be further used for modeling of pathogenic mechanisms of neurodegenerative diseases and for the evaluation of treatment protocol effectiveness including cell therapy.

EXOSOMES AS BIOMARKERS IN PATHOLOGY

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Exosomes can be used as biological markers for both negative and positive changes in the environment that surrounds the object under the study. It could be done through tracking the amount of the exosomes, which are secreted by cells before and after changes in the environment. It is also possible to determine the changes in the qualitative composition of exosomes.

Keywords: Exosomes, molecular organization, functions, exosome detecting methods, exosome content, applications of exosomes.

Environmental factors constantly affect biological objects. Consequently, cells secrete special vesicles, as a specific way of communication. Communication between cells is the most important way of regulating of vital activity of all multicellular organisms [1].

Most eukaryotic cells secrete membrane vesicles (exosomes) that can affect both neighboring and distant cells. Exosomes formed inside secretory cells in endosomal compartments are called multivesicular bodies. Exosomes are produced by a number of cell types: reticulocytes, platelets, B and T cells, mast cells, dendritic cells, macrophages, Schwann cells, astrocytes, neurons, melanocytes, mesothelioma cells, intestinal epithelial cells, adipocytes, fibroblasts, and tumor cells. Exosomes have been described to exist in many biological fluids (for example, breast milk, blood, urine, amniotic fluid, saliva, cerebrospinal fluid etc.). An exosome can contain up to 4563 proteins, 194 lipids, 1639 mRNA and 764 miRNA [2].

Exosomes have multiple functions and can be considered as an alternative method of intercellular communication. The physiological functions of exosomes include the participation in intercellular communication, the transportation of various molecules from the donor cell to the recipient cell, the stimulation of the immune system, the presentation of the antigen, immunosuppressive effects on immune and tumor cells.

The role that exosomes play in malignant and virus-infected cells is widely known. For instance, pathogenic organisms can use exosomes for intercellular communication. The pathological role of exosomes in the development of such diseases as Burkitt's lymphoma, Glioblastoma, Creutzfeldt-Jakob disease, Systemic amyloidosis, Alzheimer's disease, Huntington's disease is widely known as well [4].

Exosomes can be studied both *in vitro* and *in vivo*. The main approaches for isolating exosomes are the use of monoclonal and polyclonal antibodies, a western blot analysis, a FACS analysis, electron microscopy.

In addition to the application in clinical therapy, exosomes are utilized as a cancer vaccine (Sipuleucel-T became the first immunotherapeutic vaccine that functions using the antigen presentation that involves dendritic cells); diagnostic biomarkers, and drug delivery vesicles.

Thus, exosomes can be used as biological markers for both negative and positive changes in the environment that surrounds the object under the study. It could be done through the tracking of the amount of exosomes, which are secreted by cells before and after changes in the environment. Moreover, it is also possible to determine the changes in the qualitative composition of exosomes.

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