

LIPOSOME TECHNOLOGY IN VACCINOLOGY

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Introduction. Liposomes are microscopic structures consisting of one or more lipid bilayers, surrounded by a water layer. For practical application of the liposomes is essential their ability to include and retain substances of different nature - of inorganic ions and low molecular weight organic compounds to large proteins and nucleic acids. Due to the presence of the liposomes bilayer membranes, they may be used to transport both hydrophilic and hydrophobic drugs. Currently liposomal forms of anticancer drugs, antifungal drugs, polyene antibiotics, anti-inflammatory corticosteroids, bovine insulin and other drugs are developed. An interesting use of liposomes as carriers of antigens is to create a new generation of vaccines.

Aim. Analyze the use of liposomes as carrier epitopes in the production of modern vaccines.

Results and discussion. The achievements of modern immunology allow to obtain an isolated antigenic determinant (epitope) - part of the macromolecular antigen which is recognized by the immune system. Isolated antigenic determinant is not immunogenic. Therefore, vaccine development requires conjugation of the antigenic determinants with the carrier molecule. One promising solution to this problem involves the use of liposomes. Construction of artificial vaccines gives an opportunity to connect a number of epitopes of different specificity with common carrier, to include necessary adjuvant group into this complex. Vaccination should provide the delivery of antigenic epitopes to immunocompetent cells, while necessary to exclude the possibility of changing its structure under the action of enzymes. Furthermore, because of their resemblance to cellular membranes, liposomes are non-toxic to the body, and the compound in it is protected against degradation and dilution in the blood. Liposomes can be adsorbed in the cells, and their contents are slowly fed into the cell. Phagocytic cells can capture the liposomes by endocytosis with subsequent degradation of their membranes.

Conclusions. The antigens included in the composition of the surface membrane of the liposomes, acquire properties of adjuvants - the ability to cause a strong immune response. Other antigens may be introduced into the contents of the liposomes. In the experiment, such "liposome" vaccine caused a thousandfold increase in the immune response. Liposomes with incorporated antigens, can be administered in different ways: intravenously, intraperitoneally, subcutaneously and intramuscularly. At the injection site granuloma liposomes are formed and they can quickly reach the draining lymph nodes.