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**MONOCLONAL ANTIBODIES AND THEIR USE IN MEDICINE
(МОНОКЛОНАЛЬНІ АНТИТІЛА І ЇХ ВИКОРИСТАННЯ В
МЕДИЦИНІ)**

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*В статті розкриваються способи використання моноклональних
антитіл і їх створення біотехнологічними шляхами.*

*Ключові слова: епітопи, антитіла, мієломи, моноклональні антитіла,
гібридома, ген, скринінг, імуноглобулін, антиген.*

In the article the ways of using monoclonal antibodies are represented.

Keywords: *epitopes, antibodies, myeloma, monoclonal antibodies, hybridoma, gene screening, immunoglobulin, antigen.*

Under the influence of the animal organism antigen that contains a significant number of epitopes (antigenic determinants areas on the surface of antigen which creates antibodies), thanks to the huge number of clones of lymphocytes that produce antibodies of the same type with narrow specificity, cells of the immune system produce antibodies to each of them. It creates a mixture of antibodies, i.e. polyclonal serum. Spectrum of antibodies generated by changes during the immune response, and for the use of various animals [1].

The first stage for the creation of hybrid monoclonal antibodies, which contain two different centers to communicate with the antigens, one of which is targeted to a specific antigen, and the other to the enzyme, or medicinal substance, is the creation of a regular hybrid, synthesizing monoclonal antibodies. It is a hybrid, which plays the role of myeloma cells fused with lymphocytes obtained by immunization of mice to another antigen (enzyme or drug substance). In the result of selection and merger a secondary hybridoma is created and this cell is able to synthesize antibodies of dual specificity. Nowadays, to get hybridoms scientists use way of synthesizing monoclonal antibody from mouse or rat. However, it is not always possible to use for medical purposes. To obtain isotypes of human hybrid has been tested hybridization of myeloma rat with human lymphocytes. However, practical values of such a hybrid is not found because of the genetic instability. Another approach is the introduction of immune cells of a person to mutant mice that are virtually devoid of its own immune system. After transplantation the immune stem cells to these mice, they become cells of the human immune system and in response to introduction of antigen they start produce antibodies. Also tried to enter in the embryo of mice genes of the human immunoglobulin with the aim of

creating transgenic mice that in response to immunization with a specific antigen are capable of producing human immunoglobulin. For transgenic animal cells that synthesize specific monoclonal antibodies, it is possible to use a standard post-fusional technology, then conduct a screening (total screening) – positive cell lines and to identify and create antibodies encoded by genes of the human immunoglobulin [2].

Medicine substances are associated with monoclonal antibodies. Often medications, that are used for certain diseases, are lack of effectiveness, it may be due to the fact that they do not reach the organ or cells to the desired concentration. To facilitate delivery of the medicine to the site of action allowed its molecules to monoclonal antibodies specific to certain portions of the surface of certain cells, e.g., tumor. This requires that a monoclonal antibody must be in the necessary quantity and sufficiently cleaned, only after that it can contact with a highly specific protein of a target cell and, if necessary, to penetrate the tumor. In this case, the dose of the drug needed for treatment is significantly reduced compared to a direct use [3, 4].

Therapy using monoclonal antibodies is a method of immunotherapy that uses monoclonal antibodies to monospecificity binding with particular cells or proteins. This treatment stimulates the body's immune system to attack the selected cells. There is also a method of treatment of radioimmunotherapy in which patients taking monoclonal antibodies, labeled defined radioactive isotopes that localize the labeled cell line, leading to death of affected cells [5].

Previously, antibodies used to bind to the molecules that are involved in the regulation of T-cells, for removal of brake paths, blocking the immune response of T-cells. This method is known as “check-point therapy”. It is possible to create monoclonal antibodies specific to almost any extracellular or cell target space. In recent years conducted research and development to create antibodies to diseases such as rheumatoid arthritis, multiple sclerosis, Alzheimer's disease, Ebola and various types of cancer [6].

Література:

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