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## **Biochips**

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Bio microchips are the only one from the new devices of biology and medicine of the 21st century. Invented biochips existed at the end of the 90s in the Russian Federation as well as in the United States of America. In our time, they are rapidly being implemented by some North American biotech firms. In addition, biochips are also created in the Russian Federation, being in the focus of bio microchip laboratory of the Institution of Molal Biology. The army of the United States of America declares that it owns biochips that allow it to very quickly establish the presence of pathogenic bacteria in the sphere around it. In medicine, biochips can help, due to the downloaded time, identify about patients with curatively permanent figures of tuberculosis. Another very significant medical use of biochips is this diagnosis of leukemia and other oncological diseases.

Biochips make it possible to distinguish invisible varieties of leukemia in appearance rapidly, due to downloaded time or including time. Doctors do not have all the chances to quickly distinguish these leukemias from each other, but the treatment strategy must be correctly selected from the very beginning. In addition, the biochips give an opportunity to simultaneously distinguish two figures of a coffin bust – just healable, also weakly healable. Biochips are also used to diagnose other types of coffins [1]. Scientists in institutes as well as in pharmaceutical companies perform a one-time study of the activity of thousands and 10 thousand genes in chips and

also compare the expression of these genes in strong cancer cells as well. Such studies can help to form the latest pharmaceutical substances and also quickly find out which genes are also in what way these latest medicines function. Biochips are also considered a necessary device for the purpose of biologists, which have every chance at the same time, due to a single study, to notice the impact of different conditions (medications, proteins, feeding) in the service of 10 thousand genes [2]. Then what is this like – biochips? This created arrangement of molecules is an acid in a special carrier. Experts call this owner a "platform". The platform is more generally a plate with glass or plastic. In this sense, biochips are similar to electric chips, which are also based in silicon wafers. This created location captures a very insignificant place in the landing stage, the size of a postage stamps up to a business card, for this reason there is the term micro in the name of the biochips. The small volume of the biochip makes it possible to place a colossal number of different molecules in a small area and also read information from this area with the support of a fluorescent microscope or special laser devices for reading.

Methods of biochip production also happen to be different. One of the largest companies, according to the manufacture of biochips, creates biochips by a similar method, which is produced by electric chips. Chips are built up directly from an empty plate by photolithography with the use of specialized micromasks. The use of well-developed methods of the electric industry allowed to achieve impressive results. In one such chip there are tens of thousands of spots the size of a row of one. Any speck is the only original part of the acid with a length of 10 nucleotides.

A biochip made in a similar way is subsequently hybridized with acid molecules labeled with a dye. Compare, for example, the acid prescribed from strong cells, also the acid

prescribed from cancer cells. Acid prescribed from different patients is often compared. After hybridization, extraordinary drawings appear in the biochip. These drawings happen to be different about the usual also about cancer cells or very different in different types of leukemia. Curable varieties of leukemia provide some drawings; hopeless ones provide completely different patterns. The colored acid from various patients will form a variety of patterns in the biochip. The disease is also one later, the patterns are different. According to the type of patterns, it is possible with a huge opportunity to predict the duration of the disease in its most premature period.

Biochips are produced in no way only by photolithography. Another aspect is given if the oligonucleotides are synthesized separately, but then previously sewn to the biochip. Chips of this kind are produced in various companies, in particular, in the Capital, in the University of Molal Biology. The biochips produced in the IMB make it possible to distinguish about tuberculosis patient strains that are good from drug-stable strains. The question lies in this, that about certain patients, tuberculosis bacteria have stability to the antibiotic rifampicin, and phytoncide cannot help in any way in the cure of the disease. About a huge proportion of patients have simple bacteria and phytoncide can help. It is necessary to understand the stability of microorganisms to the antibiotic at the very source of the cure. If the doctors determine the stability of microorganisms by 2-3 months after the basis of the cure, in this case, the patient's simple ones will become thoroughly spoiled earlier. Classical methods of establishing the stability of tuberculosis microorganisms have every chance to select a number of months. Biochips make it possible to find a solution to this problem in 1-2 days [3].

Experts from the Northwestern Institute in the United States of America have created a biochip for the American

army that possesses absolutely unforeseen qualities. If DNA from pathogenic microbes enters this biochip, in this case, parts of the DNA probes with small gold particles attached to them line up in a row. A current passes through the electrodes and the biochip signals danger. A special biochip indicates the presence of bacterial danger after the gold microparticles close 2 electrodes.

Currently systems based on biochips to establish the susceptibility of malignant cells to antitumor therapy are analyzed. For example, with the support of a biochip for the personal selection of substances that effectively act on molecular targets in melanoma tumor cells, it is possible to detect changes in genes that establish the feasibility of using such drugs for targeted therapy of delayed stages and relapses of melanoma. The core of the system, the hydrogel biochip, will be modified in the future depending on the purpose of the diagnostic test, while other elements are already considered unified. Such «laboratories in a chip» will make it possible to significantly improve the property of laboratory diagnostics, reduce the possibility of infection of medical staff and ultimately increase the effectiveness and reduce the cost of treatment.

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