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THE ROLE OF ENZYMES IN BIOTECHNOLOGY

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Annotation: In the current era of globalization, the development of biotechnology, like all sciences, is taking place at a rapid pace. An in-depth study of biotechnology can increase the productivity of plants and animals. This article discusses the role of enzymes in biotechnology.

Keywords: Biotechnology, biology, enzymes, enzyme preparations, microbiology.

Biotechnology (bio-life and Greek techne - skill, art, logos - word, education), a set of industrial methods that use living organisms and biological processes in various fields of industry and medicine.A scientific field that combines the possibilities of biology and technology. "B." The term was coined by a group of scientists at Stanford University (USA; 1973) to obtain recombinant DNA (the product of the combination of two or more parts of DNA isolated from any organism in vitro) by attaching genetic molecules with different properties. After that, the results of the study of all the chemical, physical and biological processes involved in the life of living organisms, which are the result of the achievements of biological science, are used to describe the applied technological processes. began to be used. Biotechnology is based on the achievements of microbiology, biochemistry, bioorganic chemistry, molecular biology, physiology, genetics, molecular genetics, genetic engineering and others.

Microbiological biotechnology is based on the life processes of microorganisms, in which enzymes, antibiotics, amino acids, hormones, proteins and metabolites necessary for

various sectors of the economy are synthesized. For example, the Institute of Microbiology of the Academy of Sciences of Uzbekistan has been able to prepare feed for livestock from plant wastes (cotton stalks, pollen, straw and waste) on the basis of microbiological biotechnology; In some countries (Brazil), biotechnology for the production of sugar or alcohol from cellulose by special microbes, and the production of methane gas from cattle manure (especially in China, Brazil and Europe) are very cost-effective.

Membrane and immobilized enzyme biotechnology can be used to manufacture equipment for measuring and controlling a variety of processes. Also, when enzymes are immobilized (chemically attached to a level), their activity increases and their functional state is prolonged for some time. Biotechnological processes (eg membrane permeability control, enzyme mobilization, etc.) have been developed using it. The contribution of the Faculty of Biology and Chemistry of the National University of Uzbekistan (B. O. Tashmuhamedov, O. K. Tashmuhamedova, A. I. Gagelgans, M. M. Rakhimov and others) is significant.

Cell biotechnology is based on the fact that the artificial growth and reproduction of plant, animal and human cells is similar to that of microorganisms. Artificial growth of human and animal cells has enabled the production of rare biological drugs, antibodies and protein hormones on an industrial scale. The development of highly sensitive diagnostic tools based on monoclonal antibodies (antibodies produced by a single primary cell generation) for the detection of plant, animal, and human diseases has been established. In particular, the Radiopreparat enterprise under the Institute of Nuclear Physics of the Academy of Sciences of Uzbekistan and the Institute of Oncology and Radiology of the Ministry of Health of the Republic of Uzbekistan produce biotechnological devices for early detection of certain types of cancer. The synthesis of physiologically active secondary compounds is unique to plant cells. These include alkaloids used in medicine and various industries, glycosides, including steroidal saponins, substances used in the production of steroidal hormonal drugs, essential oils, polysaccharides, and phytohormones. The growing cell usually synthesizes plant-specific secondary substances from which it is derived. However, the amount of biomass synthesized in cells is much lower than in plant organs. Therefore, high-yield industrial cell biotechnology requires mutant lines that grow rapidly, have high biosynthetic properties, grow even in normal nutrient media, and are resistant to osmotic and mechanical stress.

Biotechnology is one of the youngest sciences in Uzbekistan, and its history is not long (except for ancient biotechnology; baking, yogurt, etc.). This science is mainly developing at the Institute of Microbiology of the Academy of Sciences of Uzbekistan, the Institute of Genetics and Experimental Biology of Plants and a number of plants of the Republican Chemical Association (Yangiyul Biochemical Plant, Andijan Hydrolysis Plant, Kokand Alcohol Plant).

Using biotechnological methods - from inhibitors of streptokinose, urokinose, asparginose, superoxide dismutose and other enzymes; V - glucosidases, amylases, proteases and others, blood factors (activator of tissue plasmigormones, factor VIII, human blood

albumin serum, plodextrans), hormones (insulin, proinsulin, L–, B-, and V– interferons, human

growth hormone, samototropin) and others.

The first Uzbek academician in biotechnology AG Kholmurodov (1939-1996) developed a technology for the preparation of NAD-coenzyme and vitamin complex (vitamins of group B, vitamin RR, Q 10, etc.) from fusarium fungi. Academician MI Mavloni analyzed yeast fungi found in Uzbekistan, found their species suitable for baking, winemaking and animal husbandry, and based on them special

created technologies for the preparation of yeast for yeast and winemaking. Professor KD Davranov was one of the first in the CIS to develop a technology for the preparation of fat-breaking lipase enzyme. Analyzing the causes of this enzyme's multifaceted nature, he came to the conclusion that a lipase enzyme with specific specificity is needed for each biotechnological process, and confirmed this in practice. The biological preparation "Er ointment" created by KD Davranov is based on nitrogen-fixing microorganisms and is widely used in agriculture of our country. In addition, under the leadership of QDDavranov demonstrated the decomposition of cellulose lignin biocarcasses (cotton stalks, straw, hemp stalks, sawdust, etc., enzymes of specially prepared basidiomycetes with the participation of enzymes of natural cellulozalignin. He scientifically substantiated the use of fungal enzymes called "trichodermaharzianum" and published proposals and comments on the application of this technology in practice. This technology, developed by J. Tashpulatov, used 6-7% of sugar in straw, which contains vitamins, amino acids. In addition to the production of antibiotics, technologies for the preparation of amino acids, enzymes, hormones and other physiologically active compounds have been developed. Today, amino acids necessary for medicine and agriculture (especially amino acids that are

not synthesized in the body), enzymes and other physiologically active substances i It has been proved that the technology of production has been established, and as a result, the nutrient content of straw has increased several times. The use of the activity and potential of microorganisms is associated with the creation of their productive species (strains). This task is performed in close collaboration with microbiologists by geneticists and other specialists who are familiar with genetic engineering techniques. Another way to activate the production of microbial drugs is to use two or more associations of microorganisms that can increase the activity of each other (working in symbiosis). This method is now widely used in the production of enzymes, antibiotics, vitamins and methane gas, as well as in wastewater treatment processes.

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