

related with effect of intensive external mechanical stress. According to the authors' hypothesis, in this way the cells try to protect their internal structure from external effects and damages.

The study Wase D.A.J. et al. investigated the effect of stirring on cell dimensions and shapes. Two recombinant *E. coli* strains were tested: *Escherichia coli* strain B and *Escherichia coli* NCIB 10000, as well as one *Bacillus cereus* strain and one *Staphylococcus epidermidis* strain. Linear relation between cell volume and its growth rate vs. stirring intensity (varying from 500 to 1500 rpm) was observed in all cases – increase of stirrer rotation rate lead to the increase in cell volume for each of the tested microorganisms. Comparison of end biomass yield at different stirring rates shows that the enlargement is related with increase of water content in cells.

Conclusions. We can see from the above information that stirring rate, as was assumed, exerts essential influence in submerged culturing of recombinant bacteria and represents one of the limiting factors of this process. Besides, the ratio between stirring duration, aeration intensity, and nutrient medium composition is of great importance. According to literature data, optimal stirring duration for recombinant bacterial culturing that can be used in industrial conditions is 150-400 rpm. Nevertheless, maximum quantity of accumulated biomass does not always conform to the maximum level of metabolites synthesis.

It is worth mentioning that, in some cases, no critical value of stirring device rotation rate was established, which makes the pattern incomplete. In majority of cases, the cells do not receive sufficient quantities of oxygen supplied to them at low stirrer rotation rate, and mechanical damage of cells occurs at high stirrer rotation rate. Thus, optimal stirring duration first of all depends on the culture used as a producer. Negative effect of shear stress appearing in cells at high stirring rates is observed for recombinant bacteria. This results in decreased metabolites synthesis level and decreased biomass accumulation quantity. Still, unfortunately, not all reviewed studies investigated the stirring effect on the intensity of metabolites synthesis by examined recombinant bacterial strains, which is a more essential parameter than the accumulated biomass quantity and cellular volume.

ANALYSIS OF THE ASSORTMENT OF BIOTECHNOLOGICAL PRODUCT – KVASS

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Introduction. One of the most urgent problems that arise recently in the food and processing industry is the expansion of the range of products produced, the creation of food products that have functional properties to eliminate the deficit of certain components in the diet. One of the drinks that, even without additional enrichment of biologically active substances, is beneficial for human health, is the traditional bread kvass – the oldest beverage with a pleasant sweet-sour taste and aroma of black bread, bread kvass perfectly quenches thirst, refreshes, promotes the increase appetite. Kvass is a non-alcoholic drink of unfinished mixed alcoholic and lactic fermentation. Kvass contains lactic acid, proteins, carbon dioxide, sugar, and aromatic substances that are formed during the preparation process. In the initial component (rye grains) contains calcium, phosphorus, iron, copper, manganese, zinc, cobalt. They play an important role in metabolic processes, and their entry into the body is mandatory.

Aim. The purpose of this work is to analyze the assortment of biotechnological products – kvass.

Materials and methods. Different kinds of kvass have been studied for assortment analysis. The quality of control samples of kvass was evaluated, physical, chemical and organoleptic properties such as taste, color, transparency and aroma were investigated.

Results and discussion. Using the results we can prove that the leaders in the Ukrainian kvass market are: TM «Kvas Taras» (Carlsberg Group), TM «Yarilo» («Kvas Beverages»), TM «Lvivskij kvas» («Persha privatna brovarnya»), TM «Drevlyunsky «(«Ridna marka»)» and TM «Arsenijskaya kvass» («Ukrproduct group»).

Conclusion. Based on the results of this analysis, could be concluded that kvass has a lot of benefits the human body. It has a pleasant refreshing taste, improves metabolism, and has a good effect on the cardiovascular system. Kvass has excellent taste properties; he quenches thirst due to the content of acid in it – milk and part of the vinegar; has a high energy value, promotes digestion due to the fact that it contains carbon dioxide, which facilitates the digestion of food, its absorption and increases appetite.

STUDY OF SOLVING THE PROBLEM DRUG ADDICTION

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Introduction. Nowadays, the problem of drug addiction is very acute for society. Addiction, which develops in one or another individual, is the result of the influence of a number of factors, both biological and psychological.

Drug addiction is a social phenomenon, as well as the worst disease of most countries. Drugs are substances that not only harm human health, but quickly and irreversibly destroy a person's identity. For many years, scientists all over the world have been trying to find a solution to this problem, which is one of the most urgent, both for health care and for society as a whole.

Aim. The study of new methods of modern medicine to deal and further eliminate drug addiction among society.

Materials and methods. Thanks to research of the American microbiologists, the problem of drug addiction has been solved. With the help of an adeno-associated virus, a vaccine has been created that makes the human body immune to narcotic substances. In turn, it should be noted that this virus does not pose a threat to human health. It is responsible for the transfer of genes that synthesize a protein that interferes with the action of drug.

Testing of vaccines was not conducted in humans. The influence of the preparation has a physiological effect, not a psychological one, as it was before. In this situation, the virus acts as a "messenger" which delivers the active substance to its intended purpose. As a result, the substance simply neutralizes the effect of the drug. The mechanism of action takes place in the following way in the first place the virus detains the drug in the blood, prevents it from entering the brain. Then, a protein that is synthesized under the influence of the virus neutralizes narcotic substances. The process of neutralization itself is carried out under the influence of antibodies produced by this protein.

Results and discussion. As a result of research, it was found out that adeno-associated virus is universal and is characterized by easy penetration into cells, as well as the ability to integrate into their genome. These non-cellular forms of life are widely used in gene therapy. The results of this experiment indicated that one injection of the preparation is enough for the complete rejection of the drug.

Conclusion. Vaccine is universal achievement of medicine and microbiology. Due to its properties it will allow to save mankind from drug addiction once and for all.

THE USE OF NANOTECHNOLOGY IN THE TREATMENT OF CANCER

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Introduction. Over the past few years, scientists have made great progress, working at the micro level. It is believed that nanotechnology will have the greatest success in medicine and have already ensured the delivery of drugs using nanoparticles. Modern nanomedicine has already created a scientific