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Preservation rate of microorganisms after freezing down to -196°C in non-covalent gels

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Current medical technologies, veterinary medicine, food industry there often apply the drugs containing the live microbial cells and their metabolites. For long-term storage of commercial forms of these drugs lyophilization, thermal drying and storage at low temperatures are used. Under low temperatures the suspensions of microbial cells are stored as a rule in different protective media. They reduce the damaging effect of physical and chemical factors, the development of which is related to crystallization, i.e. re-crystallization of water during cooling and thawing.

Recently an interest in designing the drug delivery systems (DDS) has been increased. Frequently there are designed the DDS for peroral application based on alginates gel. Gel matrices have high barrier properties during passing through the stomach and small intestine. Immobilization of microbial cells in the gel granules or microcapsules allows their use immediately after thawing.

We have studied the viability of the *Saccharomyces boulardii* yeast cells and *Escherichia coli* M-17 bacteria after freezing down to -196°C in noncovalent gels: carrageenan (1%), sodium alginate (1%), gelatin (2.5; 5%) agar (1%), starch (1%).

All the investigated gels were found to have a pronounced cryoprotective effect when freezing *S.boulardii* and *E.coli* M-17. They are expedient to be used as the DDS matrices of microbial preparations which are intended to be stored at low temperatures.

Biography

Vysekantsev I. is PhD (Med), he is qualified as a highest category doctor. Thirty nine years' experience of working at the Institute for Problems of Cryobiology & Cryomedicine of the National Academy of Sciences of Ukraine. During 20 years being the lecturer of the medical microbiology training course at Medical Faculty of V.N. Karazin Kharkiv National University. He currently heads the Department for Long-term storage of biological objects at low temperatures and Cryomicrobiology. Engaged in studying the mechanisms of anabiotic state of microorganisms and development of techniques of long-term storage of microorganisms for biotechnology and medical industry.

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