

The effect of drying and shelf life on the biological properties of chitosan composites containing enzymes and various therapeutic agents

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Abstract

One of the ways of development of pharmaceutical science is the design and introduction into medical practice new highly effective drugs for the treatment and prevention of wound healing. Selective accumulation of drugs in the lesion allows to solve several problems at the same time: increase the effectiveness of the drug, reduce its consumption, eliminate the undesirable effects of the drug on healthy organs and tissues. One of the problems in the modification of the therapeutic agent polymer is the loss of biological activity immediately after modification or during storage (during storage of chitosan films in the air can occur keratinization (acylation), or during operation (liquid medium, pH and temperature 37 °C).

The effect of different concentrations of chitosan on the preservation of enzymatic activity of a number of proteases (trypsin, chymopsin, bromelain, proteolytic complex of crab hepatopancreas) both in the process of obtaining composites and after drying and storage was studied. The multidirectional action of different polymers on the only one enzyme and on the single polymer on different enzymes was established.

The decrease of enzymatic activity in the process of drying immobilized (stabilized) enzymes during storage (at room temperature) and thermal inactivation in solution under physiological conditions was established. The multidirectional action of inactivation factors on the enzymes and their immobilized (stabilized) forms was shown. During the storage of immobilized materials based on chitosan solid-phase modification of chitosan-containing derivatives occurs. It has been established that neither chitosan nor the enzymes used affect the biocidal properties of Miramistin.

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