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Thematic course: Synthesis and study of the properties of composite materials based on cellulose and chitosan containing various therapeutic agents. Part 2.

Effect of chitosan on the destruction of cellulosic carriers and the kinetics of release of the therapeutic agent in the model environment

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Abstract

One of the important directions in the field of creation and research of medicines is the optimization of the therapeutic action of the active substance and the study of the interaction of the drug and its components with the body.

Numerous studies have established that a modern wound-healing agent should have the following properties: to sorb purulent discharge and its destruction products, to have cleansing properties (usually due to the introduced proteolytic enzyme), to have biocidal properties (especially with respect to pathogenic microflora and first of all with respect to to *Staphylococcus aureus*), because wound infection can significantly slow down the healing process, and in some cases contribute to the transition of the wound process to a chronic one and include an antioxidant (especially for the treatment of long-term diseases). The degradation of high-molecular compounds in the body can be biological and non-biological. From the point of view of the destruction of biopolymers, degradation under the influence of external factors existing in the environment of a living organism is of particular interest. The mechanism for the release of a therapeutic agent into a wound occurs due to the destruction of the base and the rupture of various links between the therapeutic agents and the matrix during its use: hydrolytic destruction under the action of the body environment, as well as biological destruction due to the action of various biomolecules in the medium, mainly enzymes.

On the basis of our own and literature data, schemes have been proposed for working in a model liquid medium of wound applications, based on dialdehydecellulose and chitosan, containing immobilized therapeutic agents, including enzymes. Chitosan has been shown to stabilize dialdehyde cellulose during hydrolytic degradation. Immobilization in chitosan gel, drying and storing various therapeutic agents and their mixtures in different directions affects the kinetics of drug release.

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