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POLYPEPTIDE EXTRACTION FROM ALGINATE HYDROGELS in vitro AND in vivo

T. V. Shkand 1, A. D. Roshal 2,3, N. A. Chizh 1, A. S. Varenikov 2, V. O. Cheranovsky 2, B. P. Sandomirsky 1
Dependence of rheological and diffusion properties of gels on their composition as well as desorption of active components from the resulted implants in biological objects have been studied.

The work has been performed \textit{in vitro} using step-wise extraction of polypeptides form the heart of newborn piglets and also \textit{in vivo} by implanting the «gel-extract» complex into muscular tissue of rats. The dynamics of peptide transfer was assessed using photometric and fluorometric methods.

It has been established that with the growth of alginate concentration in gel there is a transition from convective mechanism of mass transfer to molecular diffusion. The study of the dynamics of mass transfer of fluorescent protein (R-phycoerythrin) has shown that peptides release from a gel into surrounding tissues for 5 hrs with the rate of 8\% to 9\% per hours with following decrease in the extraction rate due to cross diffusion, which contributes to prolonged effect of peptides to a target organ.

Thus the data presented about mass transfer in alginate gels should be taken into account when designing the compositions of «peptide-extract gels» during transplantation into biological objects.

\textbf{Key words}: polypeptides, extraction, alginate, gel, implant.

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