**Emulsion microgels with mucoadhesive properties for intravesical drug delivery**

*Mariia* Saveleva1,\*, *Mikhail* Lobanov1, *Ekaterina* Prikhozhdenko1, *Valentina* Plastun1, and *Oksana* Mayorova1

1Saratov State University, 410012, 83 Astrakhanskaya Street, Saratov, Russia

The selection of the optimal therapy route for urinary bladder diseases is a challenge in current urology practice. One of the key processes in the disease development is a decrease in the buffering capacity of the urothelium. Depending on the type of cystitis and its cause, various therapies are prescribed, both systemic and local. Hyaluronic acid, chondroitin sulfate can be used to restore the glycosaminoglycans layer of the urothelium. The therapy with hyaluronic acid and cholesterol is indicated for intravesical administration (instillation) in the treatment of post-radiation cystitis and chronic interstitial cystitis. To achieve a sufficient therapeutic concentration of the drug in the target organ, a significantly higher dose of the active substance is required for systemic administration than for local treatment of cystitis. With intravesical instillation, a decrease in the neccessary drug dose can be achieved, as well as the absence of a significant number of side effects on the body.

The aim of this work was the desighn of the novel system for intravesical drug delivery based on the mucoadhesive emulsion microgels. The whey isolated proptein as mucoadhesive and emulsifier agent was used in the process of producing the microgels. The release kinetics of model substance in artificial urine solution was studied. The mucoadhesive properties of microgels were assessed in course of *ex vivo* mucodhesion tests with tissue of porcine urinary bladder. The comparison study of biodistribution of emulsion microgels in vivo and ex vivo in mice after systemic and intravesical administration was performed.

Thus, the developed drug carriers based on the mucoadhesive emulsion microgels demontstrate the properties of sufficient mucoadhesion to the bladder urothelium, as well as the capability of prolonged drug release, which has perspectived for the future applications in urology.

This study was supported by Russian Science Foundation (project № 21-75-10042).