**Rigorous thesis Nanofiber membranes as carriers of drugs 6.**
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# ABSTRACT

Thesis deals with the evaluation of absorption and the release properties of the nanofibre membranes that were prepared using electrospinning of chitosan solution with the contents of 5 % of a drug and covered with polyurethane layer. Thesis brings a survey about the use of nanofibre membranes in pharmacy and medicine, especially their characteristics and application at drug delivery and distribution and in tissue engineering.

The ability of three different membranes to accept and release caffeine as a model drug from their structure was investigated. The caffeine was incorporated into the membranes in company Elmarco, Liberec, or it was impregnated in the membranes using absorption from solutions containing drug. A hypothesis concerned with ability of membranes to accept a part of caffeine by another mechanism than an amount incorporated before electrospinning was confirmed.

All of three membranes were immersed in media containing caffeine and they adsorbed the drug in quantity dependent on the sort of liquid medium. At the use of the chloroform dispersions of caffeine, membranes adsorbed more then a mass of membranes themselves.

In the set of release experiments of membranes the released amount of caffeine incorporated inside as well as caffeine adsorbed on the surface was evaluated. During a short-term release (three hours experiment), non-impregnated membranes released from 2 % to 70 % of the weigh of incorporated caffeine. Almost the same among of caffeine that was incorporated in was released from membranes saturated in aqueous media. The membranes impregnated in chloroform dispersion delivered approximately 60% of caffeine that is totally bound. In the comparison with the properties of membranes at long-term (5 days lasting) release experiment was found that membranes were not able to release higher amount or the whole amount of caffeine regardless the time course.