

## **Abstract**

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Title of the diploma thesis: Monitoring of liberation tests for the release of clotrimazole from nanofibers

The diploma thesis was focused on the analysis of release profiles of clotrimazole from different types of nanofibres using non-separation flow technique, sequential injection analysis (SIA). Simultaneously the diploma thesis dealt with finding ideal conditions for saturation of the fibres with a solution of clotrimazole. Nanofibers were produced at the Technical university of Liberec.

The diploma thesis dealt with two types of nanofiber carriers - polymeric (polydioxanone and polycaprolactone) and ceramic (silica). Part of the fibre of polydioxanone and polycaprolactone was saturated directly during production in different ratios of polymer and clotrimazole. The saturated fibres were then analysed in the laboratory. The second part of polydioxanone and polycaprolactone together with ceramic nanofibers was produced in a pure state, i.e., without an active substance. These fibres were tested in the laboratory for saturation with an ethanolic solution of clotrimazole at a certain concentration for a certain time. The saturation conditions were changed during the work to closely monitor the relation between the saturation conditions and the released concentration of clotrimazole.

The measurements were performed under well-defined conditions that simulated intact healthy human skin at a temperature of 32 °C and a pH of the buffer solution of 4.5. Under these conditions, nanofiber membranes with bound clotrimazole were placed in 3 Franz cells connected in parallel to a single SIA system and liberated level of clotrimazole in the acceptor medium was monitored for 135 min. Samples were aspirated from this medium at regular 15 min intervals into a SIA system and the

content of clotrimazole was determined on-line using UV detection. The resulting release profiles of clotrimazole from individual nanofibers were compared. The main monitored parameters were the release rate of clotrimazole into the acceptor medium, the concentration and the liberation profile of clotrimazole.