

## ABSTRACT

The theoretical part describes anatomical and physiological aspects of the oral cavity, tongue and salivary glands. It captures the issue of sublingual administration of drugs. Through a brief history of nanotechnology it comes to characterize nanoparticles as basic building blocks of nanostructures. It describes the production and properties of nanoparticles, shows the advantages of using nanoparticles as a drug delivery system, but also point out their potential toxicity. At the end of the theoretical part principles and methods of measurement used in the experiments are summarized and characterized.

In the experimental part *in vitro* permeation experiments are described and evaluated. Permeation of nanoparticles marked Chromeon 470 through porcine sublingual membrane in area of 1 cm<sup>2</sup> from the donor phase of pH 6.6 to acceptor phase pH 7.4 was observed in these experiments. For the permeation experiments were used both fresh and long-term frozen sublingual membranes fixed in Franz diffusion cells with glue or silicone urease. Before starting the permeation experiments the size of nanoparticles or agglomerates were characterized using dynamic light scattering and by fluorescence microscopy.

It was verified that the two evaluated methods of fixing of membranes in diffusion cells have no statistically significant influence on the quantity of permeated nanoparticles.

**Keywords:** sublingual administration, nanotechnology, nanoparticles, fluorescence microscopy, Chromeon 470, *in vitro* permeation, Franz cell