## The comparison of absorptivity and wettability of powder and tablets containing mixture of mucoadhesive polymers and Fluconazole as active pharmaceutical ingredient

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Mucoadhesion is the process in which two materials adhere to each other for extended periods of time with the help of interfacial forces and when one of these materials is biological in nature, the phenomenon is known as bioadhesion. The theory of mucoadhesion was introduced in the controlled drug delivery field in the early eighties of the last century. A basic mechanistic approach of mucoadhesion involves two steps: (i) intimate contact between a bioadhesive and a membrane (wetting or swelling phenomenon) and (ii) penetration of the bioadhesive into the tissue or into the surface of the mucous membrane (interpenetration) [1]. A mucoadhesion promoting agent or the polymer is added to the formulation which helps in promoting the adhesion of the active pharmaceutical ingredient (API) to the oral mucosa [2-4]. In recent years many efforts have been made aiming to select not only the appropriate mucoadhesive polymers useful in drug delivery but also the best dosage form.

The main goal of our study was to determine the influence of simulated biological fluids on the wetting properties and the absorbency of the selected mucoadhesive polymers and their mixtures containing Fluconazole as active pharmaceutical ingredient (API). Moreover, to shed light on the relation between the dosage form and its wettability as well as absorptivity both the tablets and powders were studied.

The investigated materials were polymers commonly used in the mucoadhesive drug delivery systems: Carbopol 974P NF (carboxy polymethylene), Noveon AA-1 (polycarbophil), Kollidon VA 64 (poly[1-(2-oxo-1pyrrolidinyl)ethylene]), HEC (cellulose 2-hydroxyethyl ether). Moreover, mixed systems of polymers with components at different weight ratios were considered. For the research was used three types of simulated biological fluids: saliva, gastric and vaginal fluids. The measurements of advancing contact angle of simulated biological fluids on the polymeric matrix tablets (as a measure of wettability) were carried out using the sessile drop method with the instrument KSV Theta Optical Tensiometer (TL 101). The determination of the absorbency of the polymer powders were performed by the Washburn capillary rise method (WCR) using an instrument KSV Sigma 700/701.

It was found that the wettability and absorptive properties of the examined mucoadhesive powders and tablets containing Fluconazole are strongly affected by the type of polymers and the biological fluids, as well as the composition of the formulations. However, the dosage form also possess significant influence.

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