



IV. Symposium of Young Researchers on Pharmaceutical Technology, Biotechnology and Regulatory Science

January 19-21, 2022 - Szeged, Hungary

DOI: [10.14232/syrptbrs.2022.13](https://doi.org/10.14232/syrptbrs.2022.13)

Designing of buccal mucoadhesive films as a drug delivery platform for biopharmaceuticals: a preformulation study

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Oral route has been extensively studied for the delivery of biologics by virtue of its superiority over the parenteral route in terms of patient's convenience and compliance. Within this scope, buccal mucoadhesive films represent a potential delivery platform for such therapies. However, biological drugs are delicate materials which need careful considerations and manipulation to prevent their degradation and keep their biological activity during manufacturing and administration.

This work aims to investigate different factors that affect the formulation of peptide-loaded buccal mucoadhesive films prepared by film casting method. Quality by design tools have been employed to explore a variety of process parameters and material attributes that affects the quality of buccal films loaded with lysozyme as a model peptide. Based on the literature and previous experience, chitosan has been selected as a film forming polymer and the effects of seven factors were tested utilising Plackett-Burman screening design. Those factors involve the grade of chitosan, concentration of the polymer, concentration of citric acid, type and concentration of the plasticizer, the amount of the formula per plate and the applied drying temperature. Within this setting, two main responses have been selected for the evaluation, namely; the mucoadhesivity and tensile strength of the films. The output of this work will be employed in the subsequent steps of developing and optimization using one of the optimization designs of experiments.

References

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