



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

January 19-21, 2022 - Szeged, Hungary

DOI: [10.14232/syrptbrs.2022.34](https://doi.org/10.14232/syrptbrs.2022.34)

Optimization of layering technique and the secondary structure analysis during formulation of nanoparticles containing lysozyme by Quality by Design approach

Reihaneh Manteghi, Katalin Kristó, Ildikó Csóka

University of Szeged, Faculty of Pharmacy, Institute of Pharmaceutical Technology and Regulatory Affairs, Szeged, Hungary



Peptides and proteins modifications and formulation of their delivery systems are challenging tasks and hide several risks. For the purpose of this research, we carried out a Quality by Design (QbD) based protein formulation design which can be a key to develop more stable agents with efficient delivery to the target site. The effective delivery of proteins with antimicrobial activity was accomplished through the example of lysozyme (LYZ) in a novel formulation strategy as layer-by-layer polyelectrolyte core-shell nanoparticle [1]. We performed pre-formulation experiments by varying factors such as the concentration of the alginate, mixing time and the pH by the factorial design method. Based on these variations, different formulations of the LYZ were prepared, tested and optimised and the resulting nanoparticles were comprehensively characterised. Furthermore, analytical measurements and assessments were carried out using the different values for the alginate concentration, mixing time and pH which served as determinant factors for the particle size and secondary structure of the LYZ nanoparticle [2].

References

1. K. Kristó, M. Szekeres, Zs. Makai, Á. Márki, A. Kelemen, L. Bali, Zs. Pallai, I. Dékány, I. Csóka *Int. J. Pharmaceut.* 5(573), 118825 (2020)
2. K. Kristó, R. Manteghi, YH-EY. Ibrahim, D. Ungor, E. Csapó, D. Berkesi, Z. Kónya, I. Csóka (2021) *PLoS ONE* 16(12), e0260603 (2021)