

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

January 20-22nd 2021 Szeged, Hungary

OP-43

DOI: [10.14232/syrptbrs.2021.op43](https://doi.org/10.14232/syrptbrs.2021.op43)

Printing of peptide-loaded hybrid nanoparticles for oral delivery

Alharith A. A. Hassan, Katalin Kristó, Tamás Sovány

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



Oral delivery of biopharmaceuticals has been representing an extensively active area of research during last decades. Part of this increasing interest comes from the superiority of this route over the parenteral one in terms of patients' convenience and compliance. However, biopharmaceuticals are delicate materials and are liable to degradation and inactivation during manufacturing and transit in the GIT after administration. Several studies utilised a variety of nanocarriers systems to deliver those macromolecules through this route. Among them, hybrid nanoparticles constitute a promising approach to achieve this mission. Based on the physicochemical properties of the loaded drug and the required features of a platform, a variety of one-step and two-step methods have been employed to fabricate these hybrid nanocarriers. Printing technology, recently introduced to the pharmaceutical field, seems to have the potentiality to prepare such systems.

This project aims the investigation of the emerging area of additive manufacturing, namely syringe extrusion technique and inkjet printing, for the construction of orally delivered peptide-loaded hybrid nanocarriers. In this study, the principles of Quality by Design and Design of Experiments will be exploited to investigate the process parameters and material attributes that affect the characteristics and the performance of the printed hybrid nanocarriers. The physical characteristics of the nanocarriers and the biological activity of the peptide will be examined. After that, the design space for the optimized response will be determined and verified.

References

- 1 Kristo, K. *et al.* Int. J. Pharm. 573, 25-39 (2019)
- 2 Ihalainen, P. *et al.* Int. J. Pharm. 494, 585-592 (2015)

Supervisors: Tamás Sovány, Katalin Kristó