



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

January 18-20 2023 - Szeged, Hungary

OP-32

DOI: [10.14232/syrptbrs.2023.54](https://doi.org/10.14232/syrptbrs.2023.54)

Chitosan-Casein complexes as carriers for bioactive compounds

Sofia Milenkova¹, Nikolay Zahariev^{2,3}, Maria Marudova-Zsivanovits¹, Bissera Pilicheva^{2,3}

¹ Faculty of Physics and Technology, University of Plovdiv "Paisii Hilendarski", Plovdiv, Bulgaria

² Department of Pharmaceutical Sciences, Medical University of Plovdiv, Plovdiv, Bulgaria

³ Research Institute, Medical University of Plovdiv, Plovdiv, Bulgaria



Complexes based on the physical interactions between polyelectrolytes, and especially the ones based on biocompatible materials, have attracted the attention of the researchers in the medical and the pharmaceutical fields. Due to their biodegradability and lack of immune response in the human body, they can be applied as carriers for wide diversity of compounds with different pharmaceutical aim and purpose. By encapsulation of active pharmaceutical ingredients into polyelectrolyte complexes their solubility could be significantly improved along with their bioavailability. Another advantage of this process is the alternated kinetics of the release process, leading to more efficient therapy for shorter period of treatment and by applying lower doses of drugs. By combination of two types of bioactive compounds (e.g. polyphenol and pharmaceutical agent), a synergetic effect could be observed and this can be an approach for addressing the problem with antibiotic resistance and improving the anticancer treatments. Casein and chitosan are both weak polyelectrolytes from natural origin. Casein is a major milk protein with polyampholytic nature, which enables it to form complexes with both polyanionic and polycationic compounds. Chitosan is polycationic material with antimicrobial, mucoadhesive and blood clotting properties, making it highly preferable material for wound dressing and/or local application of pharmaceutical agents. In the present study, chitosan-casein polyelectrolyte complexes at different stoichiometric ratios are obtained and their possible application for delivery of one water soluble and one water insoluble compound is investigated.

Acknowledgement: The author is grateful for the financial support by the Bulgarian National Science Fund, Project № KP-06-N 38/3.