

Impact of oral biological barriers on the fate of nanoparticles in the oral cavity: translation into drug delivery

Eva Roblegg*

*University of Graz, Institute of Pharmaceutical Sciences, Pharmaceutical Technology and Biopharmacy, Universitätsplatz 1, 8010 Graz, Austria

The oral cavity, often referred as the mirror of the body, is a well-organized system that reflects and supports human health. It communicates with the external environment and fosters characteristic microorganisms. Further functions include protection, to withstand mechanical forces and prevent uptake of foreign substances, sensory perception, and secretion of saliva. Disruptions in the homeostasis increase the risk of oral diseases. Major risk factors include physical factors, immune-mediated and metabolic diseases, chemical substances and microbial infections [1]. A possible way of improving treatment of oral diseases above current standard of care is the development of drug delivery systems that can be applied locally. Thereby, the use of nano-carriers has proven advantageous at solubilizing drugs, protecting them from enzymatic degradation and prolonging their residence time. However, the rational design of such systems is still challenging, because of lack of understanding of the biological processes governing the main barriers that nanoparticles encounter during administration.

The talk will elucidate the main biological barriers taking into consideration physiological changes due to inflammation. The talk will also demonstrate how physico-chemical nanoparticle properties, such as size, surface functionalization and hydrophilicity affect colloidal stability, mobility and consequently, cellular uptake and penetration into deeper tissue [2]. Moreover, examples of therapeutic nanoparticles will be discussed [3].

1. Federation, F. W. D. The challenge of oral diseases- a call for global action (FDI World Dental Federation) 2015.
2. Teubl, B.J. et al.: *Clinical Oral Investigations*. 2018, 22(2):929-940.
3. Tetyczka, C. et al., *Int J Pharm*. 2017, 526(1-2):188-198.