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Biomaterials: A pathway to overcome biomembranesFlavia Laffleur^{1, 2}¹University of Innsbruck, Austria²Koch Institute for Integrative Cancer Research, USA

Dry eye is a disease affecting 4 and 34% of the population worldwide. Stressful conditions to ocular surface, contact lenses and systemic disease (e.g. antidepressants, thyroid disease and diuretics) cause dry eye. Complaints are dryness and tear film instability as well as evaporation caused by ocular surface changes. Therefore, it was aimed to investigate novel synthesized hyaluronic acid derivate evaluating its potential in muco adhesion and lubricant for the treatment of dry eye syndrome. Hyaluronic acid, a well-known biomaterial in the ocular delivery was chemically modified with cysteine ethyl ester (HA-CYS). HA-CYS was evaluated in terms of mucoadhesive strength on ocular mucosa. Stability measurements and lubricative assay were conducted in form of disintegration and water uptake capacity, respectively. Moreover, safety consideration proceeded with *in vitro* cell line. Most important Hen's Egg test on the chorioallantoic membrane for the mucous membrane compatibility was evaluated. According to the results, HA-CYS achieved due to thiolation, more pronounced mucoadhesive, stability and lubricative properties are enhanced. 3.81-fold increased swelling capacity, 30.5-fold more improved mucoadhesive properties and 9.72-fold higher stability of hyaluronic acid was achieved due to the chemical modification. Thus, the promising results underpin further exploitation of this versatile polysaccharide for treating dry eye syndrome.

Biography

Flavia Laffleur is a Senior Researcher of Drug Delivery in Department of Pharmacy at LFU Innsbruck, Austria. She published over 55 publications and presented papers on several international conferences. From 2010 to 2013, she completed her Doctoral thesis focused on "Smart drug delivery systems". She has been a Senior Researcher in Department of Pharmaceutical Technology in Innsbruck since 2013. Currently, she is a Researcher at Massachusetts Institute of Technology. She received several awards, including Lesmüller-Stiftung Award and Galenus Foundation Technology Award. Currently, her research focusses on "Mucosal drug delivery as well as smart delivery systems to overcome biological barriers".

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