

European Pharma Congress August 25-27, 2015 Valencia, Spain

HEA-HEMA hydrogel as a pharmaceutical delivery system for proteins: Lysozyme interaction with hydrogels

I Ermolina¹, E Hackl¹ and V Khutoryanskiy² ¹De Montfort University, UK ²University of Reading, UK

Hydrogels, the three-dimensional polymeric networks which are capable of imbibing a large amount of liquid, have attracted considerable attention over last years due to numerous applications, in particular as lenses and carriers for sustained drug delivery. Recently, we described novel hydrogels consisted of 2-Hydroxyethylmethacrylate (HEMA) and 2-Hydroxyethylacrylate (HEA). The aim of the present work is to characterise the interaction of HEA-HEMA hydrogels with a model small protein (lysozyme) and to assess the potential applications of these hydrogels as a drug delivery system for sustained release of protein therapeutics. The physicochemical (morphology, swelling, chemical structure, the total amount of water and water retention, free/bound water ratio) and mechanical properties of hydrogels loaded with lysozyme examined by different analytical techniques (SEM, UV-Vis spectroscopy, FTIR, TGA, DSC, and texture analysis) were studied. Besides, this study includes the evaluation of the protein *in vitro* loading and release, as well as analysis of the alterations in the conformation of the pharmaceutical biomacromolecules released from hydrogels using UV-Vis, FTIR, fluorescence spectroscopy (ThT assay). Both the protein deposition on the HEA-HEMA hydrogels can be applied as a drug delivery system for small proteins. Variation of the HEA-HEMA hydrogels can be applied as a drug delivery system for small proteins. Variation of the HEA-HEMA hydrogels with intermediate and high HEA content preserve their native conformation. The loading with protein has very little impact on the hydrogel properties.

Biography

I Ermolina has completed her PhD from Kazan Institute of Biochemistry and Biophysics, Russian Academy of Sciences in 1995, followed by Postdoctoral studies from Hebrew University of Jerusalem, Glasgow University and Southhampton University. Currently, she is a Senior Lecturer at De Montfort University, Leicester UK, teaching the pharmaceutical technology, pharmaceutical material sciences and analytical techniques. She has published 45 papers in peer reviewed journals and has been serving as a Reviewer for few sceintific journals.

IErmolina@dmu.ac.uk

Notes: