Abstract No.191

Ocular Delivery of Lysozyme Through Soft Contact Lenses

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The aim of this work was to study the effect of pH and temperature on the absorption and release of the lysozyme through soft contact lenses to specify optimum condition for this drug delivery to the eye. Lysozyme is a part of the innate immune system. This drug has antibacterial property and it's utilized to disinfect the eye. This property is useful particularly for the people who use soft contact lenses to repair their eye s' refractive defects. In this work Contact lenses were made by polyacrylamide hydrogel. Lysozyme was added to the lenses in two ways. In one method the drug was loaded into the lenses by soaking the lenses in lysozyme-phosphate buffer solution and in another method, the drug was added into the gel during its polymerization. Then contact lens released therapeutic levels of drug in a fresh phosphate buffer solution for a few days. The absorption and release of the lysozyme were measured in various conditions of pH and temperature by UV-Vis spectrophotometer. Normalized lysozyme activity (substrate units per mg of enzyme) was determined by using an assay that is based on the hydrolysis of the outer cell membrane of Micrococcus lysodeikticus. Samples of native and hydrogel-released lysozyme were mixed with the M. lysodeikticus suspension in phosphate buffer and the decrease in turbidity was measured. The activity of the hydrogel-released lysozyme was compared with native lysozyme to confirm functionality of the released protein. The results showed that the released lysozyme activity level was essentially identical to the native lysozyme. Therefore, lysozyme functionality was not affected upon incorporation and release through the hydrogels.

Keywords: Soft contact lens, Controlled drug release, Lysozyme, Ocular delivery.

Abstract No.192

Polymer Entry Into an Asymmetric Channel Under the Electric Field Effect

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Polymer translocation is the passage of a polymer through a narrow channel in a wall. This phenomenon is very ubiquitous in biological environments, for example the passage of proteins through the inner- and outer-cellular membranes. In addition, recently, it has found applications in the fast and cheap sequencing of nucleic acids [D. Branton et al, Nature Biotech. 26, 1146 (2008)]. Polymer entry into the nano-channels is important in the optimization of the polymer translocation [M. Wanunu et al, Nature Nanotech. 5, 160 (2010)] and the polymer separation [J. Han et al, Phys. Rev. Lett. 83, 1688 (1999)].Here, we study the polymer entry time into an asymmetric nano-channel similar to the alpha-hemolysin protein channel, under the electric field effect, using simulations. We show that the existence of a wider part before the narrow channel reduces the polymer entry time into the channel, dramatically. Moreover, we have performed simulations of polymer translocation through a channel with the dimensions of the alpha-hemolysin channel [N. Nikoofard and H. Fazli, Phys. Rev. E 85, 021804 (2012)]. The order of the entry times and their ratio from the two sides are close to the related experiment [S. E. Henrickson et al, Phys. Rev. Lett. 85, 3057 (2000)].Before entry to the channel, the polymer is compressed to the wall under the electric field. So, we study the statics and dynamics of a polymer compressed to the wall under the electric field, theoretically and with simulations. We compute the activation energy barrier of the polymer for entering the channel and its attempt time for crossing the barrier. Our theory for the activation barrier can explain the results of the previous experiments on the polymer translocation through the alpha-hemolysin channel [N. Nikoofard and H. Fazli, Phys. Rev. E (Rapid communications) 83, 050801 (2011)].

Keywords: Polymer Translocation, Asymmetric Nano-Channels, Activation Barrier.

Abstract No.193

Design new Peptide as TrkB inhibitor

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Cancer is one of the most killer disease in the world. Cancer pathology is dependent to many proteins such as Neurotrophins family such as