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

NGF, BDNF,NT3/4,NT3 and their receptors displayed crucial roles as proliferation, migration, differentiation, survival, apoptosis, In previous studies improved TRK B is as oncogene agent and BDNF bind to trk b and active signaling angiogenesis for tumor proliferation.In the current century using intelligent biomolecule such as antibody and peptides is hopeful therapies in cancers.In this study we design of new peptides by using monte carlo methods and study the effect of them on cancer cell lines. For this aim we use backrub protocol and docking with trkB as receptor. our result showed that this protocol could improve the peptide design for cancer treatment. At the first step of this protocol we designed peptide library by using sequence tolerance method in rosetta3.3 package,then peptide energy optimization performed by backrub protocol for finding peptides with more stability,the five of best peptides selected based on R software and peptide 3D-structure prediction performed by using molecular dynamic in Hyperchem 7 software. the final step is Docking of peptides with receptor trkb in HADDOCK then cyclotraxin and designed peptides.

Keywords: TrkB inhibitor, Cancer Treatment, Peptide Desining, Rosetta3.3 Package.

Abstract No.194

A Study on the Interaction of Chickpea Seedling Copper Diamine Oxidases by Tetraethylen Pentamine

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Copper amine oxidase are soluble dimeric enzymes, each monomer contains one Cu(II) ion and one organic prosthetic group 2,4,5-trihydroxyphenylalanine quinone as cofactors. Inhibitors represent important role in the study of catalytic properties of copper amine oxidase and they also find a wide application in physiological research. They catalyze the oxidative deamination of primary amines to aldehydes with a ping-pong mechanism consisting of a transamination, followed by the transfer of two electrons to molecular oxygen which is reduced to H_2O_2. Kinetic parameters K_m and V_{max} of purified enzyme by analysis of Lineweaver - Burk plot was determined 3.3 mM and 0.95 mmol/min/mg, respectively. In this study interaction chickpea diamino oxidase withtetraethylen pentamine was studied. Analysis of kinetic data indicated considerable inhibitory effects for tetraethylen pentamine. Results showed that in the presence of tetraethylen pentamine reduced apparent K_m and V_{max} i.e. tetraethylen pentamine with K_i=0.1 mM inhibits the enzyme by linear mixed inhibitory effect. In linear mixed inhibition, the inhibitor can bind to the enzyme at the same time as the substrate. However, the binding of the inhibitor affects the binding of the substrate, and vice versa. This type of inhibition can be reduced, but not overcome by increasing concentrations of substrate.

Keywords: Chickpea, Copper-Containing Amine Oxidases, Tetraethylen Pentamine, Linear Mixed.

Abstract No.195

Synthesis of Cyclooxygenase Inhibitor 2-(1-benzyl-alkyl thio-5-imidazolyl)-3-pheenyl-1, 3-Thiazolidin-4-one as Anticancer Agent

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Recently study was shown that enzyme cyclooxygenase have a role in cancer tissue. Since the derivatives of thiazolidine 4-one and other pharmacophore patterns of central ring have a cox-2 inhibitory effect, thus we decide to synthesis of novel derivatives of thiazolidin -4-ones. At first, benzyl amine hydrochloride was produced. Then the mixture of, dihydroxy acetone, thiocianate potassium was reacting for 72 hours. By alkylation and oxidation formyl imidazole was obtained .The resultant aldehyde was reacted with aniline and thioglicolic in two ways including classic (in one and two step ways) and microwave method until the title compounds were obtained.1-Classic method: In the one step way ,all the reactant (resultant aldehyde, aniline and thioglicolic) were refluxed in dean stark apparatus in dry toluene for 48 hours.B: In the two step way, at first aldehyde and aniline react in dean stark for 24 hours to give imine intermediate, then thioglicolic acid was added and reacted for 24 hours. In two stages: at first aldehyde and aniline react in dean stark for 24 hours after synthesizing dimidiate product, thioglicolicacid was added and react for 24 hours.2- Microwave method: All of reactant was treated at 800 w, 100 c for 15 minute. TLC was used to evaluate the progress of the reaction and purify material.