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Iran is a country with large production of figs, therefore study of ficin as an enzyme extracted from fig is necessary. Minor researches on autolysis show that multiple forms of ficin are not resulted from the collection, storage and purification stages. However, it is believed that autolysis begins at early stages of enzyme purification. In this study, Iranian ficin isoenzymes were purified from the fig latex of Sabz variety by high performance liquid chromatography (HPLC). Four dominant peaks of the HPLC chromatogram were chosen. The first isoenzyme was eluted from cation exchange column without salt washing and the three other isoenzymes were eluted with sodium chloride salt gradient. The aim of this research was to investigate the autolysis of each isoenzyme of Iranian ficin and the stage where the autolysis takes place. Inhibitory effect of potassium tetrathionate on autolysis was studied for the long-term maintenance of these isoenzymes. Autolysis was evaluated by HPLC chromatogram comparison, activity assay, absorbsion in 280 nm, sodium dodecyl sulfate polyacrylamide gel electrophoresis and determination of peptides or proteins status. Our results indicated that the second isoenzyme did not show any autolysis. The first isoenzyme had autolysis in the first stage. The last isoenzymes had autolysis in all different stages. Potassium tetrathionate showed the highest and lowest inhibitory effect on the last and first isoenzymes, respectively. Autolysis started shortly after elution from the column, and after a ten day, part of the isoenzymes polypeptide chain was cleaved to peptides. Peptides from autolysis with a molecular weight between 5 to 10 kDa were dominant. In this report shows the difference in isoenzymes conformations and probably it is the claim for different autolysis behavior.

Keywords: Autolysis, Ficin, Iranian Fig latex, Isoenzymes, Conformation.

Abstract No.159

Enhancement of Reversibility for Human Serum Albumim Upon Incubation with Hydroxybutyrate: Differential Scanning Calorimetry Approach

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Hydroxybutyrate is one of the important keton bodies. This compounds are produced by fatty acid metabolism in the liver when glucose doesn't available for body. In this situation hydroxylbutyrate is consumed as energetic source. Keton bodies concentration is increased in diabetes patient type I. In acute conditions, it's level reach up to 25 mM. Some of studies shows, that keton bodies concentration also is increased in diabetic patient type II. These compounds have carbonyl groups that produce free radicals and increase oxidative stress in diabetes patient. In this study, we focused on hydroxybutyrate effects on human serum albumim (HSA) structure. For this purpose, HSA was incubated with Hydroxybutyrate during 7, 14 and 35 days. The free lysine contents test shows that Hydroxybutyrate bind to free lysines at the surface of protein. Differential scanning calorimetry (DSC) results shown that the % reversibility of HSA is enhanced as follows: 43.6, 45.9, 66.6 during 7, 14 and 35 days respectively.The % reversibility enhancement is due to hydrophobicity increment. As a result, the protein aggregation able to be increased. By this way Hydroxybutyrate may cause aggregation state and participate in diabetic complexity.

Keywords: Differential Scanning Calorimetry, Diabetes, Keton body, Hydroxybutyrate, Reversibility.

Abstract No.160

Molecular Modeling of Pathological Mutations in Proteins: an Application of Structural Bioinformatics in Endocrine Diseases

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Protein modeling is the process of predicting a three-dimensional structure for a protein, based on its amino acid sequence. Usually, these protein structures are used as targets in computationally assisted drug design, may serve in functional characterization of the macromolecule or be used in protein design. Observing consequences of amino acid changes on these structures could also be of interest in further elucidation of pathological mutations effect. As example, mutations found in five cases of neonatal diabetes (a genetic

endocrine disorder) are discussed. Changes that occurred in the inwardly rectifying potassium channel gene (KCNJ11) were translated to the protein level by use of the web-based Translate tool of ExPASy Proteomics Server. A model of the protein was build based on the 3JYC.PDB structure, with the use of the HOMER server. A tetramer was subsequently built using the pre-calculated quaternary structure of 3JYC.PDB. Missense mutations that had been detected in the patients' samples, including E227K and E229K were then applied to the modeled structure and their effect studied with regard to altered interactions in and between monomers. Both mutations occur in a loop connecting two beta strands protruding from the cytoplasmic domain of the protein and are located in the interface between two monomers. Based on this model, R192, R134, and H193 of the adjacent monomer are found to have important roles in the interactions occurring in this region, which would be abolished upon mutation. Overall, this study is presented as a concrete example of protein modeling application in the study of endocrine genetic disorders. It should be mentioned that in this case, occurrence of missense mutations in the protein would be considered as one of the evidences used in the course of a change of medication in these patients.

Keywords: Protein Modeling, KCNJ11, Missense Mutation.

Abstract No.161

Study on Some Physicochemical Properties of Biomacromolecules and Their Application in Drug Targeting

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To evaluate the release pattern of films with microspheres, the release pattern of glutaraldehyde cross-linked carriers (6%, 12% and 18% w/w) has been analyzed. The objective of this paper reply to this question that if degree of cross-linking and drug conjugation capacity could change the physicochemical aspects of biomacromolecular carriers as support to immobilize an enzyme model as well as in drug targeting. The study was conducted in two different stages. In the first stage the preparation of cross-linked chitosan films and microspheres (MGn, n=6, 12 and 18) successfully took place.In the second phase, the behavioral effects were investigated by using Differential Scanning Calorimetery (DSC), Scanning Electron Microscopy (SEM), UV–Vis spectrophotometry and other spectroscopic techniques. The reactive amino groups of chitosan films and microspheres were participated in a chife-base reaction with glutaraldehyde that has at least two reactive functional groups. Some of these functional groups in the other side of the glutaraldehyde chain remain free to react with drug or enzyme's amine group (Scheme). Scheme . Synthetic method of network's macromolecule utilizing cross linking process conjugated by enzyme. Based on our results, degree of cross-linking and drug conjugation capacity, as two important factors, affect simultaneously the thermal, morphological and hydrolitic behavior of the carriers in film and microsphere forms. For example, the chitosan microspheres have low Tg (123 °C) relative to chitosan films because of its spherical structure (154 °C). The reducing of Tg in chitosan films by increasing the degree of cross linking could be because of increasing drug conjugation capacity as the key factor. Also, the morphology of the drug conjugated microspheres acquired by appeared to be little rough and irregular in shape, as evidenced by SEM, probably as a result of the microspheres aggregation. Regarding to the results from this investigation degree of cross-linking and drug conjugation capacity, as two important factors, affect the physicochemical properties drug- and enzyme-biomacromolecules. On the other hand investigation on the properties of biomacromolecules as new carriers is important because of their role in enzyme immobilization studies.

Keywords: Physicochemical Properties, Biomacromolecules, Drug Targeting.

Abstract No.162

How Social Stresses can Alter Microtubular Proteins Structure, Dynamicity and Kinetics

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Social stresses are considered as one of the major components of our modern lives. Stressful life events are generally considered as having precipitating effects on the development of human psychopathologies such as anxiety and depression. Previous works and experiments have shown that neuronal plasticity - which is defined as structural adaptation of neurons to functional requirements- can be affected by chronic and acute stress conditions. These structural changes can be