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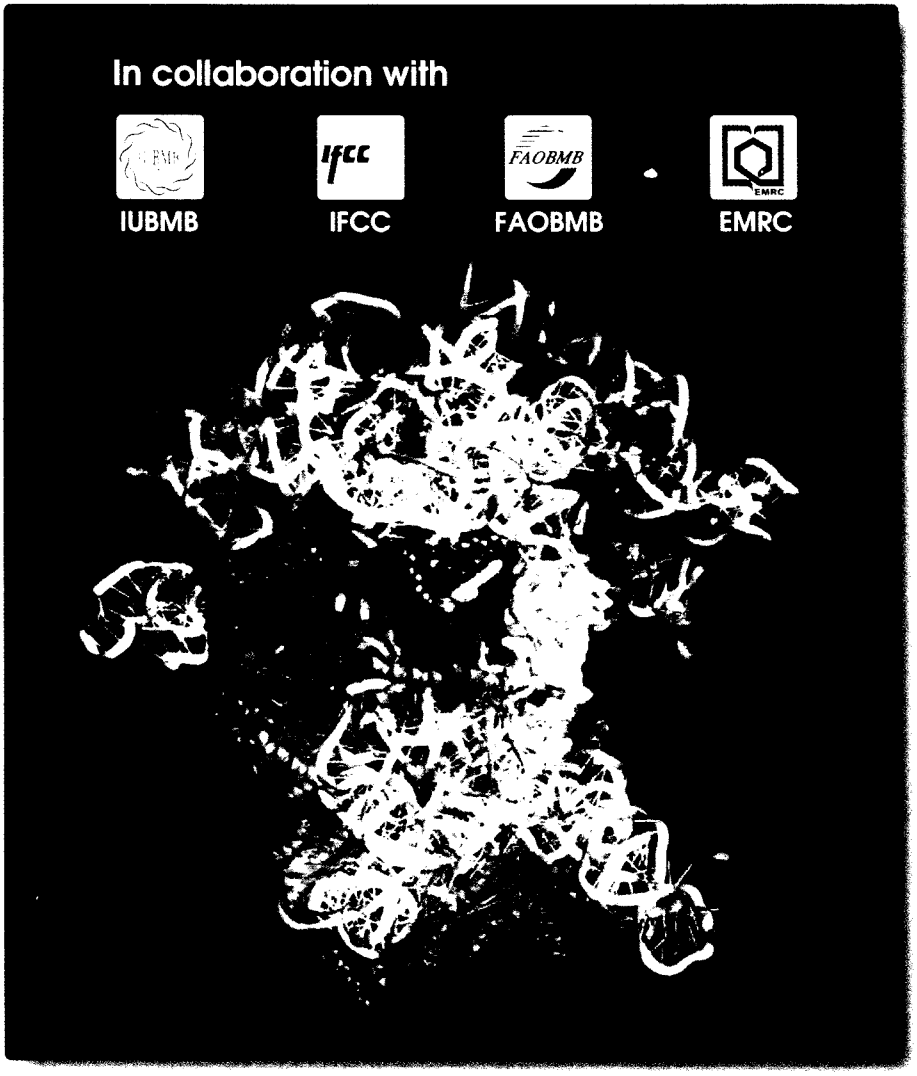

Abstracts of the 10th Iranian Congress of Biochemistry&
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and in some of them up to 10ºC thermal stability improvement were observed.

Keywords: bioinformatics, neural networks, modeling, xylanase, thermostability

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P-10-632-1
Determination effective factors of lipid metabolism at rest and during exercise

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The purpose of this review study was to determine effective factors of fat mobilization and metabolism. With considering 23 Latin articles, authors proceeded to collect these factors and concluded the results. Increased rate of physical activity causes an increased energy expenditure and fat oxidization capacity. Also age, sex, exercise intensity, and nutritional manner are other effective factors in these lines. Uptaking blood triacylglycerols by muscles is regulated by insulin in interaction with glucagon. During exercise, muscle contraction upregulates insulin and compensates its diminished levels within blood. Furthermore, exercise in 63%vo2 maximum intensity is likely to maximize fat oxidization rate. In this study the roles of chatecholamines and lipolytic enzymes has been reviewed. And finally adaptation which occurs during fat metabolism has been explained. Importance of this study has two aspects, first showing instructions to athletes for developing their performance and as second guidelines for preventing metabolic diseases.

Keywords: fat metabolism, fat mobilization, lipolysis, exercise

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P-10-557-2
Increased stability of luciferase towards proteolysis by DMSO

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Luciferase is the enzyme that catalyzes the light-emitting reaction in bioluminescent organisms and has been used extensively for sensitive applications in biotechnological processes. This enzyme is unstable against environmental proteolytic contaminations. In this study, the effect of Dimethyl Sulfoxide (DMSO) on the stability of luciferase against protease degradation was investigated. The purified recombinant luciferase was incubated by various amounts of DMSO, and then trypsin or chymotrypsin was added. Reactions were terminated by adding PMSF and samples were subjected to SDS-PAGE gel. As a main result, our data revealed that DMSO protects luciferase against proteolysis in a concentration-dependent manner. Remaining activity measurements, intensity of luciferase bioluminescence, intrinsic fluorescent and ANS binding were carried out to elucidate the effect of DMSO on the structure of the luciferase. Results indicated perturbation of native structure. It is proposed that DMSO has an important effect to stabilizing the conformation of the luciferase, prevent binding and adaptation of the protein substrate at the active site of the proteases, thereby the extent of proteolysis is reduced and its active conformation kept.

Keywords: luciferase, proteolysis, trypsin, chymotrypsin, DMSO

P-10-712-1
Enhanced heme degradation of hemoglobin in diabetes

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Protein glycation and radical formation are the most important complications of diabetes. Glycated proteins lose their normal functions. Intact hemoglobin in diabetic situation at first oxidize to methemoglobin by free radical species and then degrade during glycation process. Hemoglobin from human was purified. Samples with different percentage of methemoglobin were prepared and glycation situation was simulated. Heme degradation products were identified by spectroscopic and representative fluorescence species. By increasing the level of methemoglobin in glycated samples, fluorescence products of heme degradation were increased. During glycation, the presence of FeIII makes metHb more susceptible toward heme oxidation and degradation.

Keywords: methemoglobin, heme, glycation, spectroscopy

P-11-678-1
Thermodynamic study of intermediate state of papain at different pH condition induced by n-alkyl sulfates: a spectroscopic description

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Papain assumes a native conformation at pH 5, while the conformation of pH 3.2 is partially unfolded state. Here we report the presence of intermediate state under acidic and native condition in the presence of n-alkyl sulfates including sodium octyl sulfate, sodium decyl sulfate, and sodium dodecyl sulfate. A systematic investigation of n-alkyl sulfates induced conformational alteration in acid and native unfold state of papain was examined by tryptophan fluorescence and 1-anilino 8-sulfonic acid binding and UV absorbance. Addition of increasing concentrations of n-alkyl sulfates at acidic pH, to partially unfolded state shows decrease in tryptophan fluorescence and in quenched ANS fluorescence but to native state leads to enhancement in tryptophan fluorescence and increase in ANS fluorescence. In the presence of n-alkyl sulfates two different intermediate state I(1) and I(2) were obtained at acidic and native pH, respectively. These results altogether imply that the n-alkyl sulfates induced intermediate state at acidic pH lie between the partially unfolded state and like-native state and at native state lies between the native state and unfold. The addition of n-alkyl sulfates to the partially unfolded state and native state of papain in different pH condition appears to support the stabilized form of intermediate state. Based on the results obtained, the merits of two models of the protein-surfactant structure are discussed for various n-alkyl sulfates concentration in inducing the intermediate state at two different pH conditions.

Keywords: papain, intermediate state, spectroscopy, stability

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