characterized by retraction of apical dendrites, reduction in axonogenesis and decreased neurogenesis. The close relationship between cytoskeleton and neuroplasticity controlling system suggests the possibility cytoskeletal proteins such as Microtubular (MT) proteins alterations in high stressful conditions. It's been observed that structural modifications to tubulin monomers and MAPs occur during stressful conditions. Acute stress results in increased hippocampal expression of acetyl-Tub (a marker of stable MT) and decreased expression of Tyr-Tub (a marker of dynamic MT). However, there has been no report about the effect of stress on MT kinetics and dynamicity. In our work, we have studied the effect of social instability (as a well-known model of social stress) on the kinetic and dynamicity of male rat brains MTs. Activity of microtubules was tested in two conditions: semi-purified (without adding exogenous GTP) and purified. MT kinetics of the stress-treated and control group shows difference. Our initial results indicate that in semi-purified conditions, MTs of the stress-treated groups reach steady state quicker than the control group, but maximum polymerization of the two groups shows no difference. Significant dynamicity differences have not yet been observed. More work on structural and protein stability differences are to be done as well.

Keywords: Social Stress, Social Instability Model, Microtubular Proteins, Microtubule Polymerization Dynamicity, Microtubule Polymerization Kinetics.

Abstract No.163

Homocysteine Thiolactone Induces Insulin Fibrillation and Enhances Cytotoxic Properties of Insulin Fibrils

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While circulating level of homocysteine (Hcy) significantly increases in type-II diabetes, inhibition of insulin signaling by homocysteine thiolactone (HCTL) leading to insulin resistance. HCTL is a cyclic thioester of homocysteine, showing high reactivity toward lysine residues, causing protein damages and induces immune responses. Since insulin has no free sulfydryl group and possesses only one lysine residue on its β-chain (Lys29), this residue is considered as a potential target site for modification by HCTL. In this study the aim was to establish a relationship between insulin structural alteration and its propensity for fibrillation/aggregation in the presence of HCTL, using different spectroscopic techniques. The results revealed that HCTL increases rate of insulin unfolding, giving rise to the appearance of solvent-exposed hydrophobic regions and induces a transition from α-helix into predominantly β-sheet structures. Also thioflavin-T (ThT) fluorescence studies revealed that HCTL markedly enhanced the quantity of insulin fibril formation in both agitating and non-agitating systems. Furthermore insulin fibrils obtained in the presence of HCTL, or collected earlier in the pathway of insulin fibrillation displayed enhanced cytotoxicity against cancer cells. This study may suggest HCTL as a possible contributing factor to the pathology of insulin fibrils.

Keywords: Insulin, Fibrillation, Structure, Cytotoxicity.

Abstract No.164

Characterization Study of Human Serum Albumin Under Sodium Benzoate Incubation as an Oxidative Stress Agent

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Several parameters are involved in protein physicochemical properties alteration and abnormalities formation. Protein carbonillation under nonenzymatic modification, as "glycation ",is one of the most important parameter which bring diabetic condition with itself. According to researches, oxidative stress and reactive oxygen species can produced oxidized proteins which have carbonyl contents in it's structure.By this attitude, sodium benzoate, as an oxidative agent, can alter protein structure and function and interfere with diabetic complexity. This compound has food industrial usage in a broadly manner.In this study, the effect of sodium benzoate on human serum albumin (HSA) was studied under the presence and absence of glucose by incubating protein solution during 14, 35 and 60 days.In the presence of glucose, the results of UV and fluorescence spectroscopy indicate: HSA conformational change at 285 and 290 nm, free lysine contents reduction, raising in AGE formation compared with fresh HSA.

These changes were strengthening over the time of incubation. HSA incubation with sodium benzoate in the absent of glucose, also shows similar results. These results, emphasis on the binding of sodium benzoate to free lysines of HSA and its probability rule in diabetes complexity.

Keywords: Oxidative stress, Glycation, HSA, Glucose, Sodium benzoate, Diabetes complexity.

Abstract No.165

Thermodynamic and Spectroscopic Investigation on the Binding of Cationic and Anionic Porphyrin Derivatives to Telomeric G-quadruplex DNA formed in Presence of K+ ion

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The G-quadruplex structural motif of DNA has emerged as a novel target for anticancer drug discovery. Guanine rich sequences are found to occur throughout the genomes of most organisms and are prevalent in the promoter regions of a variety of genes and oncogenes, as well as at the telomeric ends of chromosomes. Small molecules that selectively target the G- quadruplex structure may serve as potential therapeutic agents and have garnered significant interest in recent years. Here, interaction of an anionic water-soluble phthalocyanine Cu(PcTs) and two cationic water-soluble tetrapyridinoporphyrazines including [Cu(2,3-tmtppa)] 4+ and [Cu(3,4-tmtppa)]4+ complexes with human telomeric G-quadruplex DNA has been investigated. The binding constant and stoichiometry, thermodynamic parameters and structural changes were investigated by absorption, fluoresnce and circular dichroism spectroscopy. The results indicated the interaction of cationic porphyrazines is stronger than the anionic phthalocyanine dramatically due to their different charges. In addition, higher binding constant of the 2,3-isomer with respect to the 3,4-isomer can be attributed to internal positioning of the cationic charges in the former. Hypochromicity and large red shift in the Q-band absorption region of both porphyrazines indicating existence of intercalation mode. Circular dichroism experiments (the spectra are shown) suggested that in presence of K+ ion, upon addition of ([Cu(2,3-tmtppa)]4+) or ([Cu(3,4-tmtppa)]4+), the hybrid and chair-type structure changes to the basket-type G-quadruplex structure, but upon addition of (CuPcTs) no transition occurred. In summary, our results implied that ([Cu(2,3-tmtppa)]4+) and ([Cu(3,4-tmtppa)]4+) bind strongly and selectively to human telomeric G-quadruplex DNA, inducing the formation of an antiparallel quadruplex.

Keywords: Telomeric G-quadruplex, Spectroscopy, Thermodynamic, Phthalocyanine, Porphyrazine.

Abstract No.166

Spectroscopic Studies of the Interaction Between new Designed Nanoemulsion with Human Hemoglobin

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Hemoglobin is the one- of most important and effective proteins of blood. In present study, the intraction of new synthesized nanoemulesion (as new drug carrier) with human blood carrier protein of hemoglobin (Hb) was investigatedusing different spectroscopicmethods of UV-Visible, fluorescence and circular dichroism (CD) at different temperatures of 25 and 37°C.UV-Visible results show that adding of nanoemulesion to Hb solution causes increasing the absorption of hemoglobin in all wavelength regions. Intrinsic fluorescence studies show that nanoemulesion have ability to quenching of fluorescence intensity of Hb via static quenching mechanism. Also, in the presence of different concentrations of nanoemulesion, the maximum emission wavelength of Hb was shifted to smaller wavelengths (blue shift) which indicate that with adding nanoemulesion the hydrophobicity of Triptophan environment was increased. Also, the binding site of nanoemulesion might be in near of tryptophan residue. Far UV-CD data show that nanoemulesion can change the regular secondary structure content of Hb via decreasing of content of α-helix at temperatures of 25 and 37 °C. From above results, it can be concluded that our new designed nanoemulsion can change the secondary and tertiary structure of blood protein of Hb at different temperatures.

Keywords: Hemoglobin, Nanoemulsion, Fluorescence, Quenching.
