COMPARATIVE ASSESSMENT OF PROTEIN CARBONYLS
IN VITRO AND IN VIVO IN SAMPLES FROM PATIENTS WITH
TYPE 2 DIABETES

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Abstract: The paper aims to compare the pattern of protein carbonyls
obtained in vitro from human serum albumin with the in vivo pattern from
patients with type 2 diabetes. The formation of protein carbonyls was
investigated in vitro on human albumin, which was subjected to different
hydroxyl radical generating systems. The protein carbonyl levels were
evaluated, after derivatization with 2,4-dinitrophenylhydrazine, using UV
absorption spectrophotometry and capillary electrophoresis. Experimental
results revealed that the system potassium ascorbate / iron(III) chloride
induced in vitro the best yield for carbonyl generation. Carbonyl formation
was time and concentration dependent in the range investigated. Using
capillary electrophoresis 19 derivates were separated, all with good velocity
and small to medium molecular weight. A partial similar pattern of
carbonylation was observed in vivo, in samples from patients with type 2
diabetes indicating that human albumin is a perfect surrogate for the
assessment of carbonylation process in vivo.

Keywords: protein carbonyls, pattern, in vivo-in vitro assessment, diabetes