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Rosmarinic acid, major polyphenol from Lemon balm (*Melissa officinalis*, L.) restrains non-enzymatic glycation of albumin

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Rosmarinic acid (RA) is a major component of medicinal plants such as *Melissa officinalis*. The present study demonstrates the protection of human serum albumin (HSA) from fructation at autoxidative and glycooxidation stage by Rosmarinic acid. Attenuation of Millard reaction measured by absorbance at the early stage of glycation, provided evidence for RA preventive role on HSA fructation. CD spectropolarimetry demonstrated that the transition of α to β conformer at the glycooxidation stage can be overcome by addition of RA. Moreover, fluorescent monitoring of advanced glycation endproducts (AGE) formation at emission wavelength of 440 nm revealed that RA blocks the late stage of fructation. Amyloid conformers were found to be progressively generated during fructation as measured by ThT fluorescence. Suppression of conformational alterations induced by ROS production suggested that RA inhibits the formation of cross β -structures by modifying the transition of secondary and tertiary structures. The mechanism of RA action can be explained by the transition metal ion chelating effect of RA in the oxidative reactions of AGE formation and/or by RA influence on the reactions of dicarbonyl intermediates of AGE formation. The results indicate that the multi-target mode of RA action have promising potential for prevention of diabetic complications arising from HSA glycation.

Biography

Mehran Miroliaei is currently working as an Associate Professor Department of Biology, Faculty of Sciences, University of Isfahan, Iran.

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