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## **Low-density lipoprotein, collagen, and thrombin models reveal that *Rosemarinus officinalis* L. exhibits potent antiglycative effects.**

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**Abstract:** Using the low-density lipoprotein (LDL), collagen, and thrombin models, we report here that the rosemary extracts (REs), either the aqueous (REw) or the acetonc (REA), all possessed many antiglycation-related features, and the effective concentrations required were as follows: 0.1 mg/mL for suppressing the relative electrophoretic mobility, 1.3 microg/mL for anticonjugated diene induction, 0.5 mg/mL for inhibition of thiobarbituric acid reactive substances production, 0.1 mg/mL for AGEs (advanced glycation end products) formation, 0.1 mg/mL to block glucose incorporation, and 0.05 mg/mL as an effective anti-thrombin III. Using high-performance liquid chromatography/mass spectrometry, we identified five major constituents among eight major peaks, including rosmarinic acid, carnosol, 12-methoxycarnosic acid, carnosic acid, and methyl carnosate. In the LDL model, REA was proven to be more efficient than REw; yet, the reverse is true for the collagen and the thrombin III models, the reason of which was ascribed to the higher lipid-soluble antioxidant content (such as rosmarinic acid, carnosol, carnosic acid, 12-methoxycarnosic acid and methyl carnosate) in REA than in REw and the different surface lipid characteristics between LDL and collagen; although to act as anti-AGEs, both extracts were comparable. To assist the evidence, a larger 2,2-diphenyl-1-picrylhydrazyl radical scavenging capability with less total polyphenolic content was found in REA. We conclude that rosemary is an excellent multifunctional therapeutic herb; by looking at its potential potent antiglycative bioactivity, it may become a good adjuvant medicine for the prevention and treatment of diabetic, cardiovascular, and other neurodegenerative diseases.