The isotopic exchange of oxygen as a tool for detection of the glycation sites in proteins.

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A nonenzymatic reaction of reducing sugars with the free amino group located at the N terminus of the polypeptide chain or in the lysine side chain results in glycation of proteins. The fragments of glycated proteins obtained by enzymatic hydrolysis could be considered as the biomarkers of both the aging process and diabetes mellitus. Here we propose a new method for the identification of peptide-derived Amadori products in the enzymatic digest of glycated proteins. The products of enzymatic hydrolysis of the model protein ubiquitin were incubated with H(2)(18)O under microwave activation. We observed that at these conditions the Amadori compounds selectively exchange one oxygen atom in the hexose moiety. The characteristic isotopic pattern of Amadori products treated with H(2)(18)O allows fast and convenient identification of this group of compounds, whereas nonglycated peptides are not susceptible to isotopic exchange.

Słowa kluczowe

isotopic exchange, 18O, glycation, Amadori, mass spectrometry

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