Products of Cu(II)-catalyzed oxidation in the presence of hydrogen peroxide of the 1-10, 1-16 fragments of human and mouse β-amyloid peptide.

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Streszczenie

The interactions of proteins with reactive oxygen species (ROS) may result in covalent modifications of amino acid residues in proteins, formation of protein–protein cross-linkages, and oxidation of the protein backbone resulting in protein fragmentation. In an attempt to elucidate the products of the metal-catalyzed oxidation of the human (**H**) and mouse (**M**) (1–10**H**), (1–10**M**), (1–16**H**) and (1–16**M**) fragments of β-amyloid peptide, the high performance liquid chromatography (HPLC) and matrix-assisted laser desorption/ionization mass spectrometry (MALDI-TOF MS) methods and Cu(II)/H_2O_2 as a model oxidizing system were employed. Peptide solution (0.50 mM) was incubated at 37 °C for 24 h with metal:peptide:H_2O_2 molar ratio 1:1:1 for the (1–16**H**), (1–16**M**) fragments, and 1:1:2 for the (1–10**H**), (1–10**M**) peptides in phosphate buffer, pH 7.4. Oxidation targets for all peptide studied are the histidine residues coordinated to the metal ions. For the (1–16**H**) peptide are likely His^{13} and/or His^{14}, and for the (1–16**M**) fragment His^{6} and/or His^{14}, which are converted to 2-oxo-His. Metal-binding residue, the aspartic acid (D^{1}) undergoes the oxidative decarboxylation and deamination to pyruvate. The cleavages of the peptide bonds by either the diamide or α-amidation pathways were also observed.

Słowa kluczowe

β-Amyloid peptide, Metal-catalyzed oxidation, Copper(II) complexes, Products of oxidation, MALDI-TOF MS

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