Cu(II) interaction with N-terminal fragments of human and mouse β-amyloid peptide.

Autorzy

Teresa Kowalik-Jankowska

Monika Ruta-Dolejsz

K. Wiśniewska

L. Łankiewicz

Rok wydania

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Streszczenie

The stoichiometry, stability constants and solution structure of the complexes formed in the reaction of copper(II) with N-terminal fragments of human and mouse β-amyloid peptide, 1–6, 1–9, 1–10 have been determined by potentiometric, UV/VIS, CD and EPR spectroscopic methods. The fragments 1–9 and 1–10 form complexes with the same coordination modes as the fragments 1–6. The coordination of the metal ion for human and mouse fragments starts from the N-terminal Asp residue which stabilizes significantly the 1N complex as a result of chelation through the β-carboxylate group. In a wide pH range of 4–10, the imidazole nitrogen of His^6 is coordinated to form a macrochelate. Results show that, in the pH range 5–9 the human fragments form the complex with different coordination mode compared to that of the mouse fragments. The low pK_1(amide) values (~5) obtained for the mouse fragments may suggest the coordination of the amide nitrogen of His^6 while in case of the human fragments the coordination of the amide nitrogen of Ala^2 is suggested. The replacement of glycine by the arginine residue in the fifth position of the β-amyloid peptide sequence changes the coordination modes of a peptide to metal ion in the physiological pH range. In a wide pH (including physiological) range the mouse fragments of β-amyloid peptide are much more effective in Cu(II) binding than the human fragments.

Adres publiczny

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