Structural analysis of copper(I) interaction with amyloid β peptide.

Autorzy

Giuseppe De Gregorio

Francesco Biasotto

Aleksandra Hecel

Marek Łuczkowski

Henryk Kozłowski

Daniela Valensin

Rok wydania

2019

Czasopismo

Journal of Inorganic Biochemistry

Numer woluminu

195

Strony

31-38

DOI

10.1016/j.jinorgbio.2019.03.006

Kolekcja

Naukowa

Język

Angielski

Typ publikacji

Artykuł

Streszczenie

The N-terminal fragment of Aβ (β=beta) peptide is able to bind essential transition metal ions like, copper, zinc and iron. Metal binding usually occurs via the imidazole nitrogens of the three His residues which play a key role in the coordination chemistry. Among all the investigated systems, the interaction between copper and Amyloid β assume a biological relevance because of the interplay between the two copper oxidation states, Cu(II) and Cu(I), and their involvement in redox reactions. Both copper ions share the ability to bind Amyloid β. A huge number of investigations have demonstrated that Cu(II) anchors to the N-terminal amino and His6, His13/14 imidazole groups, while Cu(I) forms a linear complex by coordinating to the His13 and His14 dyad. In this study we have analyzed Cu(I) interaction with the Amyloid β fragment encompassing the first 16 amino-acids. Our data were obtained by means of NMR spectroscopy which provided relevant structural details of the metal complexes. Our findings are consistent with the involvement of two or three His in the Cu(I) coordination sphere and indicate that His6 effectively participates to the metal binding.

Słowa kluczowe

Amyloid, copper(I), Coordination, structure, histidine, Silver(I)

Adres publiczny

https://doi.org/10.1016/j.jinorgbio.2019.03.006

Strona internetowa wydawcy

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