

Cu(II) complexes with peptides from FomA protein containing -His-Xaa-Yaa-Zaa-His and -His-His-motifs. ROS generation and DNA degradation.

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Streszczenie

Mono- and dinuclear Cu(II) complexes with Ac-PTVHNEYH-NH₂ (**L1**) and Ac-NHHTLND-NH₂ (**L2**) peptides from FomA protein of *Fusobacterium nucleatum* were studied by potentiometry, spectroscopic methods (UV-Vis, CD, EPR) and MS technique. The dominant mononuclear complexes for **L1** ligand are: CuHL (pH range 5.0–6.0) with 2N {2N_{im}}, CuH₂L (pH range 8.0–8.5) and CuH₃L species (above pH9.0) with 4N {N_{im}, 3N⁻} coordination modes. The complexes: CuH₁L with 3N {2N_{im}, N⁻}, CuH₂L with 3N {N_{im}, 2N⁻} and CuH₃L with 4N {N_{im}, 3N⁻} binding sites are proposed for the **L2** ligand. Probably in the CuH₂L complex for **CuL2** system the second His residue in His-His sequence is bound to Cu(II) ion, while the first His residue may stabilize this complex by His-His and/or His-Cu(II) interactions. The dominant dinuclear **Cu₂L1** complexes in the pH range 6.5–10.5 are: the Cu₂H₄L and Cu₂H₆L species with 3N{N_{im}, 2N⁻}4N{N_{im}, 3N⁻} and 4N{N_{im}, 3N⁻}4N{N_{im}, 3N⁻} binding sites, respectively. In the case of the **Cu₂L2** complex in the pH range 7.2–10.5, the Cu₂H₄L and Cu₂H₇L species dominate with 2N{N_{im}, N⁻}4N{N_{im}, 3N⁻} and (Cu(OH)₄²⁻4N{N_{im}, 3N⁻}) coordination modes, respectively. The ability to generate reactive oxygen species (ROS) by uncomplexed Cu(II) ions, ligands and their complexes at pH7.4 in the presence of hydrogen peroxide or ascorbic acid was studied. UV-Vis, luminescence, EPR spin trapping and gel electrophoresis methods were used. Both complexes produce higher level of ROS compared to those of their ligands. ROS produced by Cu(II) complexes are hydroxyl radical and singlet oxygen, which contribute to oxidative DNA cleavage.

Słowa kluczowe

Cu(II) complexes, Formation constants, FomA protein fragments, Fusobacterium nucleatum, Reactive oxygen species, Oxidative DNA cleavage

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