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Competition between histamine-like and poly-imidazole coordination sites for Cu^{2+} and Zn^{2+} ions in zebra-fish peptide of prion-like protein.

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Streszczenie

The fragment of the zebrafish prion-like protein (PrP-rel-2), encompassing residues 74-86 and unprotected at N-terminus (zf74-86) represents a good model to understand Cu^{2+} and Zn^{2+} binding to ligands containing multi-potential metal donor sites. Zf(74-86) contains four His and His-1 N-terminal amine groups which constitute both copper and zinc anchoring sites. The presence of His at the first position additionally provides the histamine-like binding mode which could compete with the multi-His binding mode. In this study the speciation profiles of the Cu^{2+} and Zn^{2+} complexes with zf74-86 have been obtained. The main species, dominating at physiological pH, have been fully characterized by using different spectroscopic techniques. The detected NMR chemical shift variations and line broadening enhancements, caused by Zn^{2+} and Cu^{2+} respectively, allowed to determine the metal binding sites. Both metal ions showed common binding donor atoms, being 2 or 3 His imidazoles and the N-terminal group involved in Cu^{2+} and Zn^{2+} binding.

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