Chemical and biological aspects of Cu^{2+} interactions with peptides and aminoglycosides.

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The coordination ability of histidine containing peptides towards Cu^{2+} ion is discussed. The binding ability of the peptide strongly depends on the position and number of histidine residues in the peptide sequence, the vicinal amino acid residues, and in poly-histidine peptides on the distance between the His residues within the peptide chain. The imidazole nitrogen of the His residues usually act as an anchoring site and multi-histidine Cu^{2+} binding is extremely effective; this results in the stabilization of very specific peptide structures. The nitrogen atom of the N-terminal amino group may compete with imidazole to bind Cu^{2+} ion and both of them may form an effective macrochelate coordination when they are close to each other. Amino groups of aminoglycosides are basic and very efficient binding sites for Cu^{2+} ions. The metal ion coordination to aminoglycoside antibiotics may dramatically change the pharmacological effect inducing oxidative reactions. These reactions when induced in the human body may be the reason for the side-effects caused by aminoglycosidic antibiotics.

Słowa kluczowe

Cu2+ complexes, Histidine peptides, Aminoglycoside antibiotics, Oxidative reactions, Biological implications

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