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Peptydy jako potencjalne ligandy wiążące jony metali przejściowych = Peptides as potential ligands binding transition metal ions.

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Streszczenie

Peptides are crucial ligands for transition metal ions and form complexes with them, that can have important biological activity. Many factors impact on the creation of complexes such as: protection of amine group from N-terminal or carboxylate group from C-terminals of the protein, the presence of noncoordinating and coordinating side chains in the peptide sequence, the number of histidyl residues and their location in the peptide chain. In complexes the metal ion can be bound bound by various donor atoms from amino acids residues (e.g. nitrogen, oxygen or sulphur). In general, the protection of N- or C-terminal groups influences the less stable formation of complexes. Stable complexes are created, if the free amine group from the N-terminal is involved in the coordination process. Peptides with noncoordinating side chains include alanine or glycine. Glycine complexes are more stable than these with alanine. Histidyl residue is the most effective amino acid residue in binding metal ions. The amine group of the lysyl residue, thiol from cysteine or carboxylate from aspartyl or glutamyl residues are also functional groups that coordinate metal ions. The coordination process is initiated by a group that anchors metal ion. A free amine group from N-terminus or imidazole nitrogen are the best examples of anchor groups. The metal ions can also be bound through amide nitrogens, after their forced deprotonation by the anchor group and formation of chelate rings. Peptides containing two or more histidyl residues exhibit high structural diversity in the complexes formation. In addition, these peptides can also form macrochelates and polynuclear complexes. The location of amino acid residues in the peptide chain (especially histydyl residue) also results in the thermodynamically stable formation of complexes.

Słowa kluczowe

Peptides, histidine residue, metal complexes, coordination mode

peptydy, reszta histydylowa, kompleksy metali, model koordynacyjny

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