

HENRYK - an endless source of metal coordination surprises.

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Rok wydania

2016

Czasopismo

Journal of Inorganic
Biochemistry

Numer woluminu

163

Strony

258-265

DOI

10.1016/j.jinorgbio.2016.02.030

Streszczenie

The basic knowledge about biological inorganic chemistry, thermodynamics and metal binding sites of metalloproteins is crucial for the understanding of their metal binding-structure-function relationship. Metal-peptide complexes are useful and commonly used models of metal-enzyme active sites, among which copper and zinc models are one of the most extensively studied. HENRYK is a peptide sequence present in numerous proteins, and serves as a potentially tempting binding site for Cu^{2+} and Zn^{2+} . Maybe more importantly, HENRYK also happens to be the first name of our group leader. The results of this work, which, at the first glance, might seem to be a 'chemical scrabble', went far beyond our expectations and surprised us with a novel, uncommon behavior of a Cu^{2+} complex with a peptide with a histidine in position one. At low pH, the binding is a typical histamine-like coordination, but with the increase of pH, the imidazole nitrogen is moved to the axial position and replaced with an amide; at basic pH, the binding mode is a $\{\text{NH}_2, 3\text{N}\}$ one in the equatorial plane. It is important to note, that no dimeric species are formed in between. Such binding is thermodynamically much more stable than a simple complex with histamine, and quite comparable to complexes with several possible imidazole anchoring sites.

Słowa kluczowe

Histamine-like binding, Metal-peptide complexes, thermodynamic stability

Adres publiczny

<http://dx.doi.org/10.1016/j.jinorgbio.2016.02.030>

Strona internetowa wydawcy

<http://www.elsevier.com>

Kolekcja

Naukowa

Język

Angielski

Typ publikacji

Artykuł

Plik został wygenerowany dnia 2026-10-04 00:59:06

Adres w repozytorium <https://old.chem.uni.wroc.pl/pl/repozytorium/LM2qQMq>.