

Specific binding of Cu²⁺ and Ni²⁺ ions by thioamide analogs of tetraalanine.

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Thioamide derivatives of short peptides are much more efficient ligands for Cu²⁺ and Ni²⁺ ions than their parent analogs. The most effective is the insertion of the thiocarbonyl group into the first, second, or third peptide linkage. In all of these cases, the sulfur atom is involved directly in metal ion binding, leading to the formation of very stable complexes. In all cases discussed, sulfur binding does not prevent an amide nitrogen deprotonation and its coordination to metal ion in basic solutions, although at the region close to physiological pH, sulfur is the basic donor for both Cu²⁺ and Ni²⁺ ions.

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