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Copper(II)-induced restructuring of ZnuD, a Zinc(II) transporter from *Neisseria meningitidis.*

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Streszczenie

Cluster 2 ($_{288}$HDDDNAHAHTH$_{298}$) from *Neisseria meningitidis* ZnuD is a flexible loop that captures zinc(II) ions, acting as a “fishing net”. We describe its Zn(II) and Cu(II) binding capabilities, focusing on the thermodynamics of such interactions and comparing them with the complexes of the $_{1}$MAHHHHHHL$_{9}$-NH$_{2}$ region. Copper(II) complexes with the studied ZnuD regions are thermodynamically more stable than the zinc(II) ones—Cu(II) complexes dominate in solution even in close to physiological ratios of the studied metal ions (a 10-fold excess of Zn(II) over Cu(II)). While the binding of native Zn(II) has no significant impact on the structure of its transporter, Cu(II) binding induces a conformational change of cluster 2 to a polyproline II-like helix. To the best of our knowledge, this is the first evidence of a copper(II)-induced formation of a polyproline II-like structure in a sequence that does not contain proline residues. Cu(II) coordination also changes the structure of an intracellular, N-terminal, His-rich region, folding it to an α helix.

Adres publiczny

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