

Zn(II) and Cd(II) Complexes of AMT1/MAC1 Homologous Cys/His-Rich Domains: So Similar yet So Different

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Streszczenie

Infections caused by *Candida* species are becoming seriously dangerous and difficult to cure due to their sophisticated mechanisms of resistance. The host organism defends itself from the invader, e.g., by increasing the concentration of metal ions. Therefore, there is a need to understand the overall mechanisms of metal homeostasis in *Candida* species. One of them is associated with AMT1, an important virulence factor derived from *Candida glabrata*, and another with MAC1, present in *Candida albicans*. Both of the proteins possess a homologous Cys/His-rich domain. In our studies, we have chosen two model peptides, L680 (Ac₋₁₀ACMECVRGHRSSSCKHHE₂₇-NH₂, MAC1, *Candida albicans*) and L681 (Ac₋₁₀ACDSCIKSHKAAQCEHNDR₂₈-NH₂, AMT1, *Candida glabrata*), to analyze and compare the properties of their complexes with Zn(II) and Cd(II). We studied the stoichiometry, thermodynamic stability, and spectroscopic parameters of the complexes in a wide pH range. When competing for the metal ion in the equimolar mixture of two ligands and Cd(II)/Zn(II), L680 forms more stable complexes with Cd(II) while L681 forms more stable complexes with Zn(II) in a wide pH range. Interestingly, a Glu residue was responsible for the additional stability of Cd(II)-L680. Despite a number of scientific reports suggesting Cd(II) as an efficient surrogate of Zn(II), we showed significant differences between the Zn(II) and Cd(II) complexes of the studied peptides.

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