

Influence of the modification of the cosmetic peptide Argireline on the affinity toward copper(II) ions

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Streszczenie

Argireline (Ac-EEMQRR-NH₂), a well-known neurotransmitter peptide with a potency similar to botulinum neurotoxins, reveals a proven affinity toward Cu(II) ions. We report herein Cu(II) chelating properties of three new Argireline derivatives, namely, AN4 (Ac-EAHRR-NH₂), AN5 (Ac-EEHQRR-NH₂), and AN6 (Ac-EAHQRK-NH₂). Two complementary experimental techniques, i.e., potentiometric titration (PT) and isothermal titration calorimetry (ITC), have been employed to describe the acid–base properties of the investigated peptides as well as the thermodynamic parameters of the Cu(II) complex formation. Additionally, based on density functional theory (DFT) calculations, we propose the most likely structures of the resulting Cu-peptide complexes. Finally, the cytotoxicity of the free peptides and the corresponding Cu(II) complexes was estimated in human skin cells for their possible future cosmetic application. The biological results were subsequently compared with free Argireline, its Cu(II)-complexes, and the previously studied AN2 derivative (EAHQRR).

Słowa kluczowe

Argireline, complexation process, copper(II) ions, ITC, peptides

Adres publiczny

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