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New copper(II) complexes of the anti-inflammatory drug mefenamic acid : a concerted study including synthesis, physicochemical characterization and their biological evaluation.

Autorzy

Raj Pal Sharma

Santosh Kumar

Paloth Venugopalan

Valeria Ferretti

Alketa Tarushi

George Psomas

Maciej Witwicki

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Streszczenie

Reaction of hydrated copper(II) mefenamate in the presence of diverse N-donor ligands such as N, N, N', N'-tetramethylethylenediamine (temed), ethylenediamine (en), beta-picoline (beta-pic) in a methanol : water mixture (4 : 1, v/v) yielded crystalline monomeric copper(II) complexes [Cu(temed)(mefenamato)(2)], 1, [Cu(en)(2)(H2O)(2)](mefenamato)(2), 2 and [Cu(beta-pic)(2)(mefenamato)(2)]center dot H2O, 3. The newly synthesized complexes have been characterized by elemental analysis, spectroscopic methods (FT-IR, UV-Vis and EPR), thermogravimetric analyses and single-crystal X-ray structure determination in the case of complexes 2 and 3. The ground-state geometry optimization of complex 1 was performed by DFT calculations. In order to verify the complexes capability to get bound and possibly transported by the albumin towards their biological targets (cells and/or tissues), the interaction with bovine (BSA) and human serum albumin (HSA) was studied by fluorescence emission spectroscopy. The interaction of complexes 1-3 with calf-thymus DNA (CT DNA) was monitored by UV-Vis spectroscopy, cyclic voltammetry, viscosity measurements and via the ethidium bromide (EB) displacement from the EB-DNA conjugate performed by fluorescence emission spectroscopy, as a preliminary approach to evaluate their potential biological activity.

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