

Interesting coordination abilities of antiulcer drug famotidine and antimicrobial activity of drug and its cobalt(III) complex.

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Streszczenie

Crystal structure of a novel cobalt(III) complex with antiulcer drug famotidine and ethylenediamine was determined. This is the second structure of a transition metal complex with famotidine resolved by a single crystal X-ray analysis, in which famotidine shows different mode of coordination than that observed in the other cases. Drug molecule is coordinated to metal ion as a tetradentate ligand through guanidine N6, thiazole N4, thioether S2 and terminal N3 atom. Two NH₂ groups (N3H₂ and N6H₂) are deprotonated and drug coordinates as dianion. In the asymmetric unit, one chloride anion and one water molecule were found to complete the complex stoichiometry. The structure of the complex is abundant in atoms, which can be involved in hydrogen bond formation either as hydrogen acceptors or hydrogen donors. Because of that, a great number of hydrogen bonds dominates the crystal packing. Beside the hydrogen bonds, there are two interesting noncovalent interactions: CH $\cdots$ π and NH $\cdots$ π within the famotidine anion, which stabilize the complex structure. The $\pi\cdots\pi$ stacking interactions between neighboring complex cations are also observed. Antibacterial and antifungal activity of famotidine and its newly synthesized complex against representative bacteria: *Escherichia coli*, *Staphylococcus aureus* and *Micrococcus lysodeikticus* and fungi: *Aspergillus niger* and *Candida albicans* were examined. The results indicate a higher selectivity of the famotidine–Co(III) complex, as well as better growth inhibitory activity (lower MIC values (MIC, minimal inhibitory concentration)) in comparison with the drug alone.

Słowa kluczowe

Crystal structure, Cobalt(III) complex, Famotidine, Histamine H₂ receptor antagonist, π Interactions, Microbiological assay

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