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Specific interactions of Bi(III) with the Cys-Xaa-Cys unit of a peptide sequence.

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The medicinal application of bismuth compounds is focused in two fields: antimicrobial and anticancer. Bi(III) complexes have been used in medicine as an effective treatment of microbial infections, such as peptic ulcers, diarrhoea, gastritis and syphilis. (212)Bi and (213)Bi are strong alpha-particle emitters, which, bound to specific ligands, could be promising targeted radio-therapeutic agents for the treatment of cancer. In this work, the coordination of bismuth to three peptides with the Cys-Xaa-Cys motif was studied by potentiometric, spectroscopic, mass spectrometric and NMR methods. We have shown, that sulfur atoms from cysteines are critical donors for the coordination of Bi(III). Our investigation provides insight towards an understanding of the chemistry of bismuth-containing complexes and may lead to the further application of this metal in medicine.

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