

Title: ANTIBACTERIAL POTENTIAL OF METAL COMPLEXES SYNTHESIZED WITH DERIVATIVE LIGANDS OF 2-THIAZOLINE-2-THIOL AGAINST GRAM-NEGATIVE BACTERIA.

Authors Ferreira, L.S.¹, Souza, J. de P.¹, Braga, A.V.¹, Herrera, K.M.S¹, Chagas. R.C.R¹, Ferreira, J.M.S¹

Institution ¹UFSJ- Universidade Federal de São João del Rei/ Campus Centro Oeste Dona Lindu (Rua Sebastião Gonçalves Coelho 400 Bairro Chanadour – Divinópolis/MG, CEP: 35501-296).

Abstract:

The use of metal complexes as antimicrobial agents has attracted the interest of the scientific community. In this context, compounds obtained from 2- thiazoline-2-thiol derivative ligands, have a wide variety of structures due to the presence of NH and CS groups, and they have been studied to treat infections of bacteria that have shown resistance to the available drugs. Thus, the objective of this study was to evaluate in vitro antimicrobial potential of 15 metal complexes against three Gram-negative bacteria of clinical importance: *Pseudomonas aeruginosa* (ATCC 25619), *Proteus mirabilis* (ATCC 15290) and *Klebsiella pneumoniae* (ATCC 4352). To evaluate the antimicrobial activity of the compounds, the minimum inhibitory concentration (MIC) was determined by broth microdilution technique as established by the CLSI (2003). The minimum bactericidal concentration (MBC) was determined by plating aliquots of 25µL of each MIC well in Agar Mueller Hinton and incubating the plates at 35 ° C for 18h. It was observed that the silver complexes achieved the best results. The L1-Ag⁺ complex exhibited MIC values of 125 and 15,63µg/mL against *P. aeruginosa* and *K. pneumoniae*, respectively. Furthermore, the MIC values of the L2-Ag⁺ complex were equivalent to those related to the positive control. This compound also demonstrate bactericidal activity with CBM values equal to 500µg/mL against *K. pneumoniae* and *P. mirabilis*. The other compounds that showed bacteriostatic activity were L1-Co²⁺, L1-Cu²⁺, L1-Zn²⁺ and L2-Zn²⁺. Both ligands, Hydrotris(2-Mercaptothiazolyl)Borate (L1) and 1,2-Bis(2-thiazolin-2-ylsulfanyl)ethane (L2), did not exhibit antibacterial activity when not linked to metals, indicating that the presence of the metal interferes with the activity of the compounds. Streptomycin was used as positive control and, presented MIC of 3,91µg/mL against *P. aeruginosa*, 15,63µg/mL against *P. mirabilis* and 7,81µg/mL against *K. pneumoniae*. The bactericidal activity of the antibiotic was shown only against *P. mirabilis* at a concentration of 250µg/mL. The silver complexes were shown to be promising antimicrobial agents and should have their cytotoxicity evaluated in further studies.

Keywords: antibacterial activity, metal complexes, Gram-negative bacteria.

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