

Antimicrobial Properties of the Ternary Zn(II) Complex with Sulfadiazine and 2,2'-bipyridine as Ligands [†]

Juan José Martínez Medina ^{1,*}, Dana Belén Falkievich ¹, Cristian Villa Pérez ², Delia Beatriz Soria ^{2,*}

¹ Instituto de Investigaciones en Procesos Tecnológicos Avanzados (INIPTA, CONICET-UNCAUS), Universidad Nacional del Chaco Austral, Comandante Fernández N° 755, Presidencia Roque Sáenz Peña (3700), Chaco, Argentina; juanjoc_mm09@yahoo.com.ar (J.J.M.M.); danabelen07@hotmail.com (D.B.F.)

² Centro de Química Inorgánica (CEQUINOR, CONICET-UNLP), Facultad de Ciencias Exactas, Universidad Nacional de La Plata, Bv. 120 N° 1465, La Plata (1900), Buenos Aires, Argentina; cvillap@unal.edu.co (C.V.P.); soria@quimica.unlp.edu.ar (D.B.S.)

* Correspondence: juanjoc_mm09@yahoo.com.ar (J.J.M.M.); soria@quimica.unlp.edu.ar (D.B.S.);

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Abstract: Sulfadiazine (SDZ) is a bacteriostatic sulfonamide that inhibits the enzymatic activity of dihydropteroate synthetase by blocking the folic acid synthesis in bacterial cells. 2,2'-bipyridine (bipy) is a N,N'-bidentate ligand widely used as a coligand with a broad antimicrobial spectrum. The antimicrobial profile of these compounds could be enhanced upon complexation with an antiseptic metal like zinc. This work aimed to evaluate the antimicrobial properties of the Zn(II)SDZbipy complex. The minimum inhibitory concentration (MIC) was determined against five bacterial strains and seven fungal strains of the *Candida* genus by the agar dilution method. Briefly, the microbial suspensions were inoculated onto the plates containing Mueller Hinton agar with different concentrations of the tested compounds (3.9 - 1000 µg/mL) and incubated aerobically at 37 °C for 24 and 48 h for bacteria and fungi, respectively. The complex showed MIC values from 125 to 500 µg/mL (clinically relevant) against *Pseudomonas aeruginosa*, *Staphylococcus aureus*, *Staphylococcus epidermidis*, *Candida albicans*, *Candida glabrata*, and *Candida krusei*. Complexation also enhanced the antimicrobial activity of SDZ against *Escherichia coli* and the *Staphylococcus* and *Candida* strains mentioned above. In summary, the complexation of conventional chemotherapeutic agents is a powerful tool for designing alternative broad-spectrum antimicrobials.

Keywords: sulphadiazine coordination compound; antibacterial activity; antifungal activity.

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Conflicts of Interest

The authors declare no conflict of interest.