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Antitubercular activity of silver(I) complexes with 4,7–dichloroquinoline(DCQ)

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Mycobacterium tuberculosis (MTB) is the pathogen responsible for Tuberculosis (TB) disease, which is highly contagious in its active stage, and occurs commonly in the pulmonary form. One of the consequences of the COVID–19 pandemic pointed out by the World Health Organization (WHO) was the reversal of years of world progress in the fight against TB. WHO also highlighted the growth of deaths due to the disease for the first time in the last ten years. In addition, to the increase in deaths from TB, there has been a decrease in people being diagnosed, treated, or receiving preventive treatment [1]. In the present work, we presented the synthesis and characterization of homo/heteroleptic complexes of silver(I) ions with DCQ. Spectroscopic, analytical, and crystallographic methods were used to study the three silver complexes. Moreover, biological assays were performed to assess cytotoxicity and resistance against clinical strains of *M. tuberculosis*. Complex (1) was formulated as {$[AgNO_3(DCQ)_2(H_2O)]$ / $[AgNO_3(DCQ)_2]$} showing 1:2 (M:L1) while complexes (2) – $[Ag(DCQ)(Bpy)]NO_3$ and (3) – $[AgNO_3(DCQ)(PPh_3)]$ have shown a 1:1:1 (M:L1:L2) molar ratio, where L1= DCQ and L2 = 2,2'–bipyridine (Bpy) or triphenylphosphine (PPh_3). The crystalline structures of (1) and (3) were obtained by single crystal X–ray diffraction, while the crystal structure of (2) was obtained by powder diffraction state–of–art [2-4]. Biological assays in vitro were performed for the compounds against *Mycobacterium tuberculosis* H37Rv (ATCC 27294). Complexes (1) and (3) showed MIC_{90} values close to 12 µmol L^{-1} which make them promising antimycobacterial agents for future in vivo studies over tuberculosis.

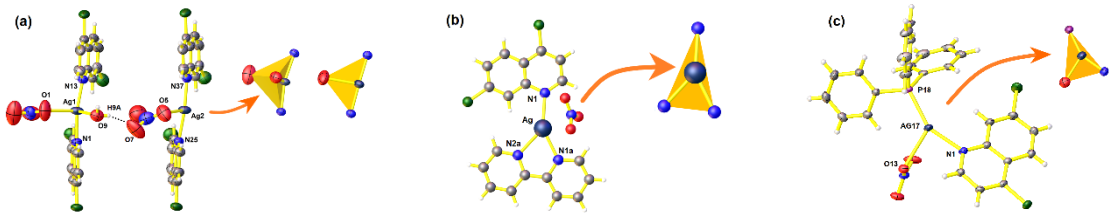

Figure: Crystal structure of silver complexes, (1-a, 2-b and 3-c) with labeled donor atoms and silver(I) ions.

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References

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