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SYNTHESIS AND CHARACTERIZATION OF *N,N′,N′′*-DONOR SULFONAMIDE LIGANDS TERMINATED WITH QUINOLINE RINGS AND THEIR PLATINUM COMPLEXES

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Platinum complexes have been extensively studied for their antimicrobial and anticancer properties owing to their ability to interact with DNA and proteins and in recent years there has been a growing interest in the development of novel N-donor ligands that can enhance the biological activity. This study focuses on the synthesis and characterization of novel *N,N′,N′′*-donor linear sulfonamide ligands terminated with quinoline rings and their corresponding platinum complexes to explore their potential biological applicability. Specifically, we are investigating two bis(2-methylquinolinyl)sulfonamide ligands (**L**), in which the central N is within a tertiary sulfonamide containing a dangling R group (R = Me and 5-(dimethylamino)-naphthalene). The ligands and their neutral platinum complexes were characterized using various spectroscopic techniques including ^{1}H and ^{1}H–^{1}H ROESY NMR, UV/Visible, FTIR, and fluorescence. Analysis of ^{1}H NMR spectral data shows a sharp singlet corresponding to methylene protons indicating that L binds to the metal monodentately to produce a symmetrical complex. If the ligands were bound bidentately or tridentately, the free rotation of the methylene protons will be restricted, producing complicated NMR signals. Further, it is reported that the tertiary sulfonamide (in similar ligands) do not favor anchoring meridionally coordinated five-membered chelate ring/s with Pt(II) ions. Thus, we conclude that the new complexes are formed in [*trans*-Pt(DMSO)Cl_2]$_2$(μ-**L**) form, which is strongly supported by the 2D NMR data. However, confirmation of the structure would be achieved by an X-ray crystallographic analysis. Currently, the [*trans*-Pt(DMSO)Cl_2]$_2$(μ-**L**) complexes are being evaluated for their potential antimicrobial activity against both gram-positive and gram-negative bacterial growth *via* the disc diffusion method. In addition, the potential anticancer activity of these compounds will be evaluated. These studies will provide valuable insights into the potential therapeutic applications of the newly synthesized compound.

Keywords: Anticancer, antimicrobial, N-donor sulfonamide ligands, quinoline