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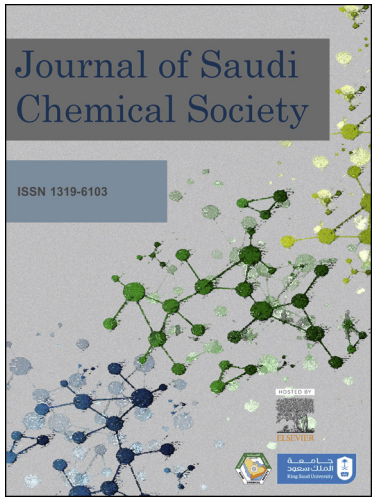

Original article

Synthesis, spectral characterization, theoretical, antimicrobial, DNA interaction and *in vitro* anticancer studies of Cu(II) and Zn(II) complexes with pyrimidine-morpholine based Schiff base ligand

M. Sankarganesh, J. Rajesh, G.G. Vinoth Kumar, M. Vadivel, L. Mitu, R. Senthil Kumar, J. Dhaveethu Raja

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ACCEPTED MANUSCRIPT

Synthesis, spectral characterization, theoretical, antimicrobial, DNA interaction and *in vitro* anticancer studies of Cu(II) and Zn(II) complexes with pyrimidine-morpholine based Schiff base ligand

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Abstract Novel Cu(II) (**1**) and Zn(II) (**2**) complexes with 4-(1-(4-morpholinophenyl)ethylideneamino)pyrimidine-5-carbonitrile) (**L**) have been synthesized and characterized by various spectroscopic and analytical techniques. DFT (density functional theory) studies result confirms that, LMCT mechanism have been done between **L** and M(II) ions. The antimicrobial studies indicate that the ligand **L** and complexes **1** & **2** exhibit higher activity against the *E. coli* bacteria and *C. albicans* fungi. The groove binding mode of ligand **L** and complexes **1** & **2** with CT-DNA have been confirmed by electronic absorption, competitive binding, viscometric and cyclic voltammetric studies. The electronic absorption titration of ligand **L** and complexes **1** & **2** with DNA have been carried out in different buffer solutions (pH 4.0, 7.0 & 10.0). The K_b values of ligand **L** and complexes **1** & **2** are higher in acidic buffer at pH 4.0 ($K_b = 2.42 \times 10^5$, **L**; 2.8×10^5, **1**; 2.65×10^5, **2**) and the results revealed that, the interaction of synthesized compounds with DNA were higher in the acidic medium than basic and neutral medium. Furthermore, CT-DNA cleavage studies of ligand **L** and complexes **1** & **2** have been studied. The *in vitro* anticancer activities results

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