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Probing the potency of triazole tethered Schiff base complexes and the effect of substituents on their biological attributes

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Abstract

Two triazole-derived Schiff base ligands and their eight octahedral metal(II) complexes were designed and synthesized. They were characterized by elemental analysis and various spectroscopic techniques. The compounds were evaluated for their DNA binding tendencies with Calf thymus DNA. The concentration dependent chemical nuclease activity was also explored with supercoiled pBR322 DNA. The in vitro antimicrobial screening was undertaken which showed similar activity to the DNA binding studies. Complex 5 revealed exceptional DNA binding affinity, cleaving propensity and antimicrobial efficacy though all the complexes showed activity. All copper(II) complexes were evaluated for their antiproliferative activity against a panel of human cancer cell lines. Complexes 1 and 5 showed activity against all the cell lines with low toxicity towards normal cell line. The effect of substituents on the ligand system of the complexes is also discussed along with the importance of tuning the ligand system.

Keywords: Cytotoxicity; DNA interactions; Triazole analogues.