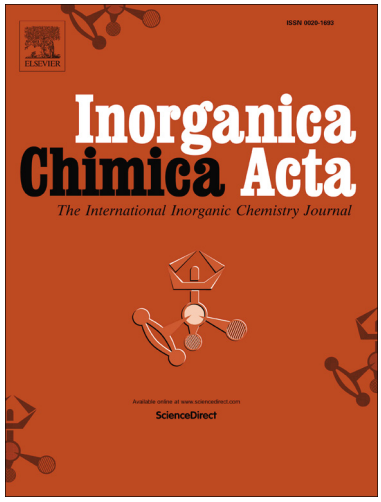

Research paper

Quinoline based Pd(II) complexes: Synthesis, characterization and evaluation of DNA/protein binding, molecular docking and *in vitro* anticancer activity

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Quinoline based Pd(II) complexes: Synthesis, characterization and evaluation of DNA/protein binding, molecular docking and *in vitro* anticancer activity

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Abstract

Two new palladium(II) complexes from 2-methyl 4-amino quinoline were synthesized and characterized by analytical, spectroscopic and X-ray diffraction techniques. The binding affinity and binding mode of the ligand and mononuclear complexes toward CT-DNA/BSA were determined by spectrophotometric titrations. From the binding studies, it has been found that the complexes interact strongly with CT-DNA and BSA. An *in vitro* cytotoxicity study of the compounds against human lung (A-549) and breast (MCF-7) cancer cell lines indicted better cytotoxic effect.

Keywords: Quinoline; Palladium(II) complex; DNA/protein binding; Cytotoxicity.

Introduction

Even though a lot of attention has been paid in the study of metal complexes with bioactive ligands to enhance their bioactive profiles, inactive ligands have also been equally used in such studies expecting that they may subsequently acquire pharmacological properties [1-6]. Quinolines are a class of compound that has been used in agriculture as fungicide besides being used as preservatives in wood, paper and textile industries [7]. However, alkaloid and alkaloid based compounds contain quinoline as an important structural unit which exhibited substantial biological activities [8,9]. Moreover, the biological activities such as antioxidation, antiproliferation and anticancer have been exhibited by the derivatives of quinoline [10-13]. This has really created a special interest in the synthesis of transition metal complexes of quinolines and to study their role in inhibiting cancer cell proliferation and microbial growth [14-17]. The results have indicated that the complexes thus prepared have not only shown significant pharmacological properties but also revealed interesting coordination modes of quinolines in the complexes. Since the cisplatin as an anticancer drug has shown not only side effects but also resistance, Pt(II) complexes have been tried as an alternative drugs due to their similarities in structure and thermodynamic properties [18,19]. Consequently, we synthesized two new Pd(II)