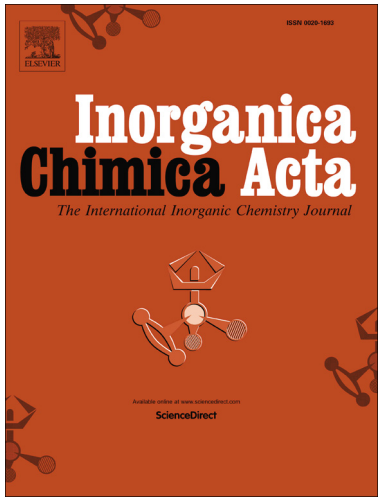

Research paper

An investigation on the DNA/protein binding, DNA cleavage and *in vitro* anticancer properties of SNO pincer type palladium(II) complexes with N–substituted isatin thiosemicarbazone ligands

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An investigation on the DNA/protein binding, DNA cleavage and *in vitro* anticancer properties of SNO pincer type palladium(II) complexes with N–substituted isatin thiosemicarbazone ligands

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Abstract

Three pincer type palladium(II) complexes (**1–3)** were synthesised from the reactions of $PdCl_2$ with thiosemicarbazone ligands (**L1–L3),** and characterized by elemental analyses and UV Visible, FT–IR, ^{1}H & ^{13}C NMR spectroscopic techniques. The molecular structure of **2** was confirmed by single crystal X–ray crystallography. The X–ray diffraction study of complex **2** revealed the pincer type tridentate SNO coordination of N–substituted isatin thiosemicarnbazone with the palladium ion. The binding affinity and mode of the palladium(II) complexes (**1–3**) toward calf thymus DNA (CT–DNA) and bovine serum albumin (BSA) were determined by UV–Visible and fluorescence spectrophotometric methods. Spectral evidences showed intercalative mode of DNA binding with the palladium(II) complexes. The magnitude of hypochromism is in the order of **3>2>1**, which reflects the DNA binding efficacy of the complexes. The binding mode was further confirmed by CD spectra which indicate the non–groove mode of binding; hence the intercalative mode of binding is proposed. The alterations in the secondary structure of the protein by the complexes were confirmed by synchronous fluorescence spectroscopic studies. Spectral evidences also showed good binding property of the complexes with the protein. Complexes (**1–3**) cleaved the pUC19 plasmid DNA in the absence of an external agent. The complexes were found to possess significant *in vitro* cytotoxicity against human breast (MCF7) and lung (A549) cancer cell lines.