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Biological contour, molecular docking and antiproliferative studies of DNA targeted histidine based transition metal(II) complexes: Invention and its depiction(Article)

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Abstract

A novel series of histidine derived transition metal complexes were synthesized and characterized by multispectral techniques such as UV-Vis., FT IR, EPR, NMR, ESI-mass analysis and other physico-chemical methods like elemental analysis, molar conductivity, magnetic susceptibility. The synthesized compounds were attempted for their biological prospective. The biological studies involved are DNA interaction (binding and damage), antimicrobial, antioxidant, antiproliferative and molecular docking. DNA interaction studies were carried out with the help of UV-Vis absorption titration, viscosity measurement and cyclic voltammetric techniques which revealed that the synthesized compounds could interact with CT-DNA through intercalative binding mode. A gel electrophoresis assay demonstrated the ability of complexes to cleave the supercoiled pUC18 DNA. The antioxidant property shows that the metal complexes have preferable ability to scavenge hydroxyl radical than the ligand. Moreover, the antimicrobial assay indicates that these complexes are good antimicrobial agents against various pathogens. Furthermore, the in vitro antiproliferative activities of the complexes were examined on HeLa, Hep G2 and NIH 3 T3 cell lines using an MTT assay. The morphological changes were investigated using Hoechst 33258 staining apoptosis assay. In addition, molecular docking studies were executed to considerate the nature of binding of the synthesized complexes with protein and DNA. Copyright © 2018 John Wiley & Sons, Ltd.

Author keywords

antioxidant activity antiproliferative activity DNA interaction histidine molecular docking

Indexed keywords

Engineering controlled terms:

Amino acids Antimicrobial agents Antioxidants Binding energy Bins Biosynthesis
Cell culture Cell death Chemical analysis DNA Electrophoresis Lanthanum compounds
Magnetic susceptibility Metal complexes Microorganisms Molecular modeling
Nuclear magnetic resonance Plants (botany) Transition metal compounds Transition metals
Viscosity measurement

Engineering uncontrolled terms

Anti-oxidant activities Anti-proliferative activities DNA interaction Histidine
Molecular docking

Engineering main heading:

Synthesis (chemical)

Cited by 14 documents

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