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(54) Title of the invention : "A NOVEL RUTHENIUM(II)-BIS(BENZIMIDAZOL-2-YL)PYRIDINE-CHLOROPHENYLTERPYRIDINE COMPLEX: IN VITRO ANTICANCER AND CYTOTOXIC POTENTIALS ON BREAST CANCEROUS MDA-MB-231 AND NORMAL L6 CELL LINES"

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(57) Abstract :

The present invention introduces a novel ruthenium(II)-benzimidazole-chlorophenyl terpyridine complex, [Ru(bbp)(Cl-Ph-tpy)]²⁺, which has been investigated for its potential anticancer activity against MDA-MB-231 breast cancer and normal L6 cell lines. The complex underwent thorough characterization utilizing various spectroscopic techniques. In vitro studies were conducted employing direct microscopic observation and MTT assay methods. The IC₅₀ values of the complex against MDA-MB-231 and normal L6 cell lines were determined to be 24.35 µg/mL and 156.317 µg/mL, respectively. These findings indicate significant antiproliferative effects of the complex on breast cancer cells, with lower cytotoxicity towards normal cells. Furthermore, the complex demonstrated dose-dependent inhibition of cell growth, as evidenced by the formation of formazan crystals. Consequently, the [Ru(bbp)(Cl-Ph-tpy)]²⁺ complex presents promising activity against breast cancer cells and holds potential as a drug candidate for breast cancer treatment. The in vitro antiproliferative and cytotoxic potential of the novel [Ru(bbp)(Cl-Ph-tpy)]²⁺ complex (where bbp = 2,6-bis(benzimidazol-2-yl) pyridine and Cl-Ph-tpy = 4'-(4-chlorophenyl)-2,2':6',2''-terpyridine) against MDA-MB-231 breast cancer and normal L6 cell lines has been assessed using direct microscopic and MTT assay methods. The synthesized complex has been thoroughly characterized by spectral analysis. The IC₅₀ values of the [Ru(bbp)(Cl-Ph-tpy)]²⁺ complex against the MDA-MB-231 and normal L6 cell lines were found to be 24.35 µg/mL and 156.317 µg/mL, respectively. These IC₅₀ values indicate a significant antiproliferative effect of the synthesized complex on MDA-MB-231 cells and lower cytotoxicity towards normal L6 cells. The results demonstrate a dose-dependent percentage of growth inhibition of the cells, as evidenced by the formation of formazan crystals. Therefore, it is evident that the [Ru(bbp)(Cl-Ph-tpy)]²⁺ complex exhibits promising activity against breast cancer cells and is recommended as a potential drug candidate for breast cancer treatment.

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