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Pulsatile drug delivery systems - single unit systems (Targeted drug delivery systems)

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Pulsatile drug delivery systems are gaining a lot of interest as they deliver the drug at the right place at the right time and in the right amount, thus providing spatial and temporal delivery and increasing patient compliance. These systems are designed according to the circadian rhythm of the body .the principle rationale for the use of pulsatile release of the drugs is where a constant drug release is not desired. These systems are basically time-controlled drug delivery systems in which the system controls the lag time independent of environmental factors like pH, enzymes, gastro-intestinal motility. The pre clinical studies have shown that pulsatile approach of delivering antibiotic is more effective.

Different single unit capsular pulsative drug delivery systems have been developed. A general structure of such systems consists of an insoluble capsule body containing a drug and a plug. The pulsicap system under the capsular systems is the system which is made up of water-insoluble capsule body filled with formulation. The body is closed at the open end with a swell able hydro gel plug. Upon contact with the dissolution medium or gastro-intestinal fluids, the plug swells and after a lag time, pushes itself out of the capsule. This leads to drug release at a pulse. The lag time can be controlled by manipulating the dimensions and position of the plug .The port systems which is under Osmosis based capsular systems consists of a gelatine capsule coated with a semi permeable membrane. Inside the capsule was an insoluble plug and an osmotically active agent along with the drug formulation. When the capsule comes in contact with the dissolution medium water diffuses across the semi permeable membrane resulting in increased pressure inside that ejects the plug after a determined lag time. The lag time is controlled by coating thickness.

Synthesis, characterization and DNA binding properties of Ru(II) molecular "light switch" complexes

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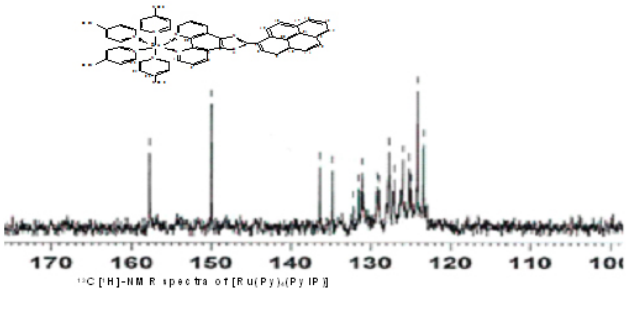
This article presents recent progress in our laboratory on the interactions of Ru(II) polypyridyl complexes with calf thymus DNA. Mixed polypyridyl Ru(II) complexes $[Ru(L)_4(AIP)]^{2+}$ and $[Ru(L)_4PyIP]^{2+}$ where L is 4-Amino pyridine (AIP = 2-(9-Anthryl)-1H-imidazo[4,5-f][1,10]phenanthroline; PyIP = 2-(1-pyrenyl)-1H-imidazo[4,5-f][1,10]phenanthroline) have been synthesized and characterized by elemental analysis, physicochemical methods such as ESI-MS, UV-Vis, IR and NMR spectroscopic techniques. Electronic absorption titrations, fluorescence spectroscopy, viscosity measurements and salt dependent studies of calf-thymus DNA in the presence of incremental amounts of all four Ru(II) complexes clearly demonstrate that two complexes can bind to DNA in an intercalation mode. The DNA binding affinities of these complexes follows the order $[Ru(4\text{-}APy)_4(PyIP)]^{2+} > [Ru(4\text{-}APy)_4(AIP)]^{2+}$. Irradiation of PBR 322 DNA with these complexes results in nicking of the plasmid DNA. Further, these two complexes synthesized were screened for their antimicrobial activity. In addition, all complexes exhibited the DNA "light switch" properties. All These experimental results suggest that both ancillary ligand and intercalative ligand influences binding of these complexes to DNA.

Key words: Ru(II)complexes; polypyridyl ligand; fluorescence; light switch effect; photocleavage.



^{13}C [^1H]-NMR spectra of $[Ru(Py)_4(PyIP)]$