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Effect of bridge structure on the binding mode of the binuclear ruthenium (II) polypyridyl dimer complex to calf-thymus DNA**Jeon Bo Ram, Min Ik Kwak, Sung Wook Han, Seog K Kim and Yoon Jung Jang**
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Ruthenium (II) polypyridyl dimer containing the large planar aromatic bridging ligands [μ -(tpphz)(phen)₄Ru₂]⁴⁺ (phen=1,10-phenanthroline, tpphz=tetrapyrido[3,2-a:2',3'-c:3'', 2''-h:2''', 3'''-j] phenazine, bis-Ru-tpphz) have been synthesized and characterized by elemental analysis, ¹H NMR. The binding mode of the newly synthesized bis-Ru-tpphz to DNA was compared to those of the bis-Ru-bip and bis-Ru-tatpp complexes. The structure of connecting bridge of latter two bis-Ru complexes is different. Absorption and reduced linear dichroism spectrum reveal that the planar linker moiety of the bis-Ru-tatpp complex is inserted between the DNA base-pairs in spite of steric hindrance originated from its large ruthenium ligand part while the bis-Ru-bip complex which has flexible linker binds at the groove of DNA. The binding mode of the bis-Ru-tpphz complex which has fused shorter bridge ligands than bis-Ru-tatpp complex is in contrast with the other two complexes. Also in the presence of ethidium bromide, a classical intercalator, binding of bis-Ru-tpphz complex to DNA did not interfere with ethidium binding. The bis-Ru-tpphz complex binds either at the groove of DNA or to the negatively charged phosphate group: Intercalative binding was prohibited due to either short bridge structure or steric hindrances from the phenanthroline ligand. In conclusion, the structure of the bridge of bis-Ru(II) complex takes an important role to determine the binding mode of these compounds to DNA and in order to have the mode of insertion, the bridge ligand structure must be not only fused planarity, but also their distance should be long enough.

Biography

Jeon Bo Ram has completed her graduation and is currently pursuing Postgraduate studies from Yeungnam University majoring in Biophysical Chemistry.

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