

Bis-heterometallic RAPTA type complexes as antiproliferative agents

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Ruthenium(II)-arene RAPTA-type compounds have been extensively explored for their medicinal properties.^[1] The general formula of RAPTA family complexes is $[\text{Ru}(\eta^6\text{-arene})(\text{PTA})\text{X}_2]$, (PTA = 1,3,5-triaza-7-phosphadadamantane). Our research group has investigated the possibilities of the ligand dmPTA (N,N'-dimethyl-1,3,5-triaza-7-phosphadamantane) and its parent ligand dmoPTA (3,7-dimethyl-1,3,7-triaza-5-phosphabicyclo[3.3.1]nonane), which shows interesting coordinative properties with ability to form bis-metallic Ru-M complexes.^[2] In this communication we present the new bis-metallic RAPTA-type complexes $[\text{Ru}(\eta^6\text{-}p\text{-cymene})(\text{Cl})_2(\mu\text{-dmoPTA-}\kappa\text{P,N,N'})\text{-MCl}_2]$ (M = Co^{2+} , Ni^{2+} , Zn^{2+}) (Fig. 1). The study of antiproliferative activity of the obtained complexes against colon cancer cell line Caco-2/TC7 displayed the significant influence of second metal on antiproliferative properties of the monometallic complexes $[\text{Ru}(\eta^6\text{-}p\text{-cymene})(\text{Cl})_2(\text{dmoPTA})]$ (Fig. 1c). The result obtained showed that the complexes display different properties and action mechanism depending on the nature of metal, M, bonded to the $\text{CH}_3\text{N}_{\text{dmoPTA}}$ atoms.

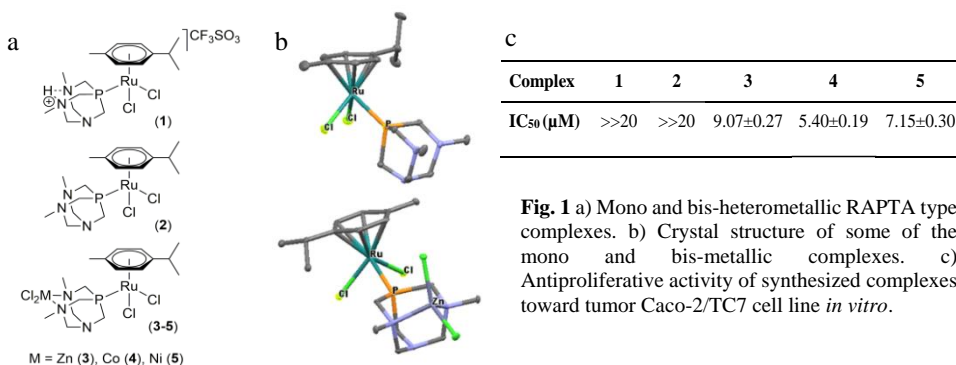


Fig. 1 a) Mono and bis-heterometallic RAPTA type complexes. b) Crystal structure of some of the mono and bis-metallic complexes. c) Antiproliferative activity of synthesized complexes toward tumor Caco-2/TC7 cell line *in vitro*.

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