ABSTRACT

TITLE:	Continued Studies on a New Octahedral Cobalt(III) Complex as a Possible Anti-Cancer Prodrug: Synthesis and Characterization Studies in Solid-State and Solution
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ABSTRACT: Small coordination complexes with redox active metal centers are of interest for their potential uses in anti-cancer research. For example, KP1019 and NAMI-A are ruthenium(III) coordination complexes that are currently in phase II clinical trials for their anti-tumor or antimetastatic properties and contain various ligands, including indazole and dimethylsulfoxide, respectively. Utilizing a more abundant, less expensive cobalt metal center in place of ruthenium(III), we hypothesized that structurally similar cobalt(III) complexes could be synthesized. A new solid, isolable complex was achieved using a ligand substitution reaction via refluxing and crystallization techniques starting from the known complex trans-dichlorotetrakis(pyridine)cobalt(III) chloride. The new product is an octahedral Co(III) coordination complex that contains indazole and labile dimethylsulfoxide ligands. The proposed structure of the Co(III) complex is supported by elemental analysis and magnetic susceptibility measurements in the solid state, along with solution characterization studies of 1H and 13C NMR and mass spectrometry. This complex displays promise in utilizing a new metal center for expanding metal-containing prodrugs. Further studies are in progress to determine the exact speciation in the solid-state and in solution, as well as investigating the efficacy of this new compound on cancer cell lines.