New iron(III) and cobalt(III) coordination compounds: synthesis, characterization and evaluation of antitumor activity

Carina A. S. Senra,[1] Priscilla P. Luz[1]*

[1]*Universidade Federal do Espírito Santo, 514 Fernando Ferrari Av., Vitória, 29075-910, Brazil*

*priscilla.luz@ufes.br

Research area on coordination compounds is very promissing due, for example, to their biomedical application. The development of new inorganic compounds as pharmaceutical drugs has estimulated the evaluation of metallic ions activities over biological systems. Reseachers have demonstrated coordination compounds are usually more active than free ligand or even display therapeutic properties not exhibited by free ligand.[1] An important member of triazinane derivatives was synthesized in the 80's decade and it exhibited a great inhibition of aromatase enzyme, which is responsible for estrogen production. So this triazinane derivative was considered and applied as a good antitumor pharmaceutical drug for breast and ovarian cancer treatments.[2] This work aimed the synthesis and characterization of new Fe^{3+}, iron(III), and Co^{3+}, cobalt(III), coordination compounds as anticancer drugs. A triazinane derivative (TRZ) was applied as a ligand organic molecule. Coordination compoounds were sythesized by mixing alchoolic solutions of each metallic ion to a triazinane alchoolic solution, at 1:1 metal:ligand molar ratio. Obtained compounds were characterized by infrared (IR) spectroscopy, and electrospray mass spectrometry on negative ion mode. Antitumor activities were investigated against a cell line of human pancreatic carcinoma. Free ligand was used as reference standard at all necessary measurments. IR spectra indicated monodentate coordination through carboxylate group for both compounds and bi and monodentate coordination to triazinane ring for FeTRZ and CoTRZ, respectively. Mass spectrometry indicated the following molecular formulas: $Na_6[C_{34}H_{44}Fe_2N_{12}O_{24}]$ and $Na_4[C_9H_{18}Cl_4CoN_3O_9]$. $3H_2O$ for FeTRZ and CoTRZ, respectively. Combining the results from IR and mass spectrometry, coordination compounds chemical structures were proposed and are shown on Figure 1. Antitumor activities showed significant differences for both coordination compounds. FeTRZ exhibited an aggressive activity against the tested cell line, while CoTRZ was few active. In conclusion, two new coordination compounds were synthesized and the compound containing Fe^{3+} as metallic center was highly effective against a human pancreatic carcinoma's cell line.

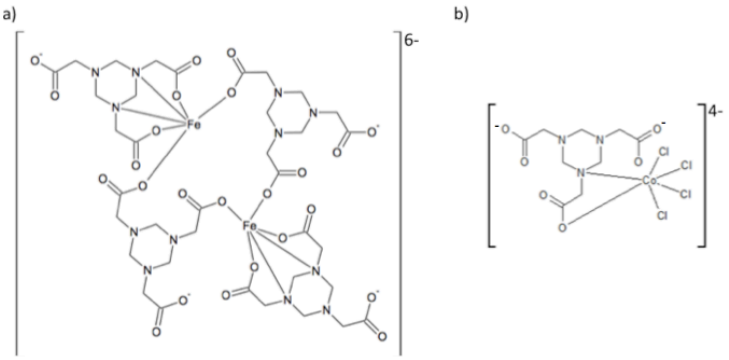

Figure 1: Structure proposal for a) FeTRZ and b) CoTRZ coordination compounds.

[1]Grevy, J. M.; *et al.*; *Inorg. Chim. act*. **2002**, *339*, 532. [2]Cavalcante, M.; *et al.*; *Quim. Nova*. **2000**, *23*, 20.

FAPES and CNPq