Author(s): Moreno, V (Moreno, Virtudes); Lorenzo, J (Lorenzo, Julia); Aviles, FX (Aviles, Francesc X.); Garcia, MH (Helena Garcia, M.); Ribeiro, JP (Ribeiro, Joao P.); Morais, TS (Morais, Tania S.); Florindo, P (Florindo, Pedro); Robalo, MP (Paula Robalo, M.)

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Abstract: Four cationic ruthenium(II) complexes with the formula [Ru(eta(5)-C5H5)(PPh3)(2)](+), with L = 5-phenyl-1H-tetrazole (TzH) 1, imidazole (ImH) 2, benzo[1,2-b; 4,3-b'] dithio-phen-2-carbonitrile (Bzt) 3, and [5-(2-thiophen-2-yl)-vinyl]-thiophene-2-carbonitrile] (Tvt) 4 were prepared and characterized in view to evaluate their potentialities as antitumor agents. Studies by Circular Dichroism indicated changes in the secondary structure of ct-DNA. Changes in the tertiary structure of pBR322 plasmid DNA were also observed in gel electrophoresis experiment and the images obtained by atomic force microscopy (AFM) suggest strong interaction with pBR322 plasmid DNA; the observed decreasing of the viscosity with time indicates that the complexes do not intercalate between DNA base pairs. Compounds 1, 2, and 3 showed much higher cytotoxicity than the cisplatin against human leukaemia cancer cells (HL-60 cells).

Addresses: [Moreno, Virtudes] Univ Barcelona, Dept Quim Inorgan, Barcelona 08028, Spain; [Lorenzo, Julia; Aviles, Francesc X.] Univ Autonoma Barcelona, Inst Biotecnol & Biomed, E-08193 Barcelona, Spain; [Helena Garcia, M.; Ribeiro, Joao P.; Morais, Tania S.; Florindo, Pedro] Univ Lisbon, Fac Ciencias, Ctr Ciencias Mol & Mat, P-1749016 Lisbon, Portugal; [Ribeiro, Joao P.] CSIC, Ctr Invest Biol, Madrid 28040, Spain; [Paula Robalo, M.] Inst Super Tecn, Ctr Quim Estrutural, P-1049001 Lisbon, Portugal; [Paula Robalo, M.] Inst Super Engn Lisboa, Dept Engn Quim, P-1959007 Lisbon, Portugal

Reprint Address: Moreno, V, Univ Barcelona, Dept Quim Inorgan, Marti y Franques 1-11, Barcelona 08028, Spain.

E-mail Address: virtudes.moreno@qi.ub.es

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