In vitro antiproliferative activity of palladium(II) thiosemicarbazone complexes and the corresponding functionalized chitosan coated magnetite nanoparticles

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Resumen

This work reports the synthesis and characterization of palladium(u) complexes Pd(L-1)(2) (1), Pd(L-2)(2) (2), Pd(L-3)(2) (3) and Pd(L-4)(2) (4), where (LH)-H-1: 1-naphthaldehyde thiosemicarbazone; (LH)-H-2: 4-phenyl-(1-naphthaldehyde)thiosemicarbazone; (LH)-H-3: (2-hydroxy-1-naphthaldehyde)thiosemicarbazone; (LH)-H-4: 4-phenyl-1-(2-hydroxy-1-naphthaldehyde)thiosemicarbazone. All four complexes show in vitro antiproliferative activity against the following human tumor cell lines: H460, DU145, MCF-7, M14, HT-29, K562, and HuTu 80. In particular Pd(L-1)(2) has the most potent activity for all the studied cell tines (IC50 similar to 11 mu M), with the exception of H460. Pd(L-2)(2) is a promising candidate as a pharmacological agent, since it presents a significant activity and is more innocuous than cisplatin against mouse fibroblast normal cells, 3T3. Pd(L-4)(2) is the complex which exhibits the lowest activity against the same cell line (IC50 similar to 11 mu M), being ten times lower than that of Pd(L-1)(2). These complexes were used to functionalize chitosan coated superparamagnetic magnetite nanoparticles with a metallic core of 11-13 nm, and the activity of these functionalized nanoparticles (NPs) against diverse human tumor cell lines was also tested. The nanoparticles functionalized with Pd(L-1)(2), Pd(L-3)(2) and Pd(L-4)(2) show antiproliferative activity against DU-145, while those with Pd(L-2)(2), Pd(L-3)(2) and Pd(L-4)(2) against HuTu80.

Palabras clave

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